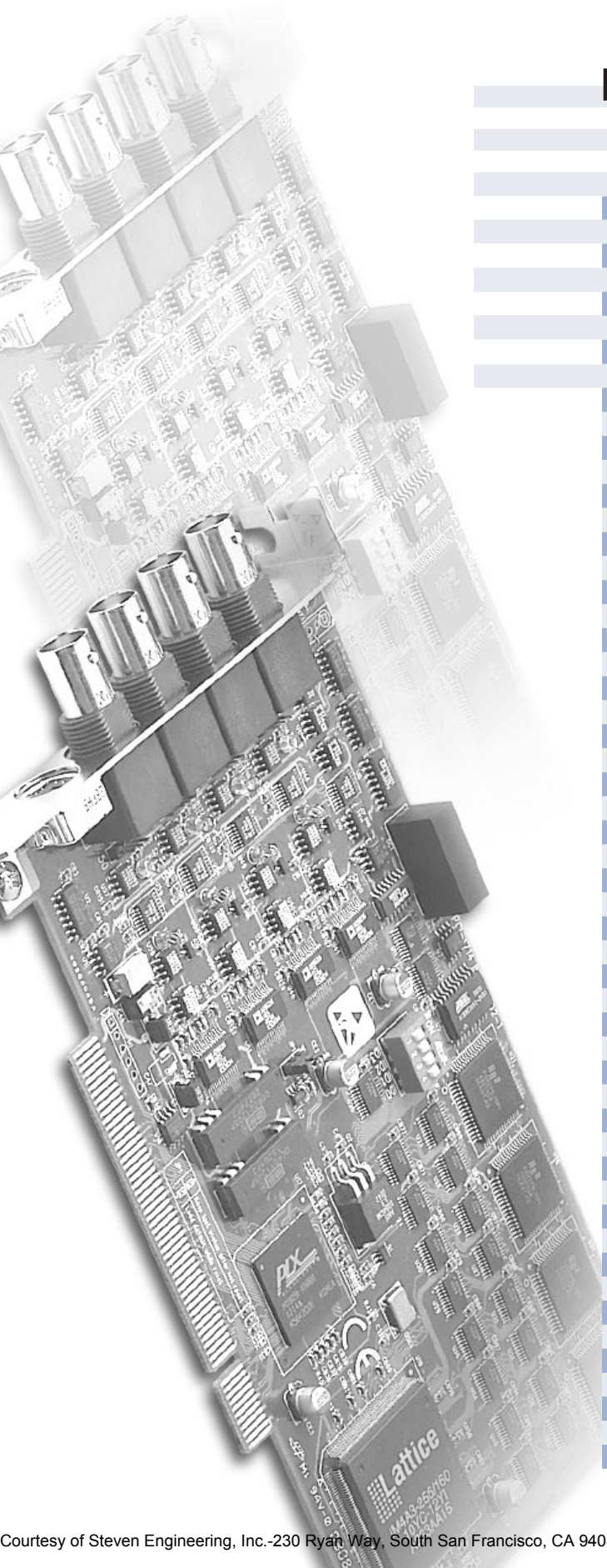
10

Plug-In I/O Cards



Data Acquisition and Control Tutorial & Software		***10-2***
ActiveDAQ Pro Introduction		***10-4***
Glossary		***10-6***
Selection Guide		***10-8***
PCI-1710	100 kS/s, 12-bit, PCI-bus Multifunction Card	***10-14***
PCI-1711	100 kS/s, 12-bit, 16-ch S.E. Input Low-cost Multifunction Card	***10-16***
PCI-1712/PCI-1712L	1 MS/s, 12-bit, 16-ch High-speed Multifunction Cards	***10-18***
PCI-1716/PCI-1716L	250 kS/s, 16-bit, 16-ch High-resolution Multifunction Cards	***10-20***
PCI-1718	12-bit Multifunction Card with PCI Bus	***10-22***
PCI-1741U	16-bit Multifunction Card with PCI Bus	***10-24***
PCI-1742U	1 MS/s, 16-bit, 16-ch High-resolution Multifunction Card	***10-26***
PCL-711B/S	Analog and Digital I/O Card	***10-28***
PCL-812PG	MultiLab Analog and Digital I/O Card	***10-29***
PCL-818	High-performance Multifunction Card	***10-30***
PCI-1713	100 kS/s, 12-bit, 32-ch Isolated Analog Input Card	***10-32***
PCI-1715U	500 kS/s, 12-bit, 32-ch, Isolated Analog Input Card	***10-33***
PCI-1714/PCI-1714UL	30/10 MS/s Simultaneous 4-ch Analog Input Cards	***10-34***
PCI-1747U	250 kS/s, 16-bit, 64-ch Analog Input Card	***10-35***
PCL-813B	32-ch S.E. Isolated A/D Card	***10-36***
PCI-1720U	4-ch Isolated Analog Output Card	***10-37***
PCI-1721	12-bit, 4-ch Advanced Analog Output Card	***10-38***
PCI-1723	12-bit, 8-ch Isolated Analog Output Card	***10-39***
PCI-1724U	14-bit, 32-ch Analog Output Card	***10-40***
PCI-1727U	14-bit, 12-ch Analog Output Card	***10-41***
PCL-726/PCL-728	6/2-ch Analog Output Cards	***10-42***
PCI-1735U	64-ch TTL Digital I/O Card	***10-43***
PCI-1737U	24-ch TTL Digital I/O Card	***10-44***
PCI-1739U	48-ch TTL Digital I/O Card	***10-45***
PCI-1751	48-bit Digital I/O and Counter Card	***10-46***
PCI-1753/PCI-1753E	96/192-ch Digital I/O Cards	***10-47***
PCI-1755	80 MB/s Ultra High-speed 32-ch Digital I/O Card	***10-48***
PCI-1757UP	24-ch Digital Input/Output Low Profile Universal PCI Card	***10-49***
PCL-720+	64-ch TTL Digital I/O Card	***10-50***
PCL-722	144-ch Digital I/O Card	***10-51***
PCL-724	24-ch TTL Digital I/O Card	***10-52***
PCL-731	48-ch TTL Digital I/O Card	***10-53***
PCI-1730/PCI-1733/PCI-1734	32-ch Isolated Digital I/O Cards	***10-54***
PCI-1736UP	32-ch Isolated Digital Input/Output Card	***10-55***
PCI-1750	32-ch Isolated Digital I/O and Counter Card	***10-56***
PCI-1752/PCI-1754/PCI-1756	64-ch Isolated Digital I/O Cards	***10-57***
PCI-1758	128-ch Isolated Digital I/O Card	***10-58***
PCI-1760U	8-ch Relay Actuator and Isolated DI Card	***10-59***
PCI-1761	8-ch Relay Actuator/ Isolated DI PCI Card	***10-60***
PCI-1762	16-ch Isolated DI/ Relay Output Card	***10-61***
PCI-1763UP	Low-profile 8-ch Relay/Isolated DI Card	***10-62***
PCL-725	8-ch Relay Actuator/Isolated DI ISA Card	***10-63***
PCL-735	12-ch Relay Actuator Card	***10-64***
PCI-1780U	8-ch Counter/Timer Card	***10-65***
PCL-836	6-ch Counter/Timer Card	***10-66***
PCM-3712/PCM-3718/PCM-3724	PC/104 Cards	***10-67***
PCM-3725/PCM-3730/PCM-3780	PC/104 Cards	***10-68***
PCI-1670	GPIB Interface PCI Card	***10-69***
PCI-1671UP	High-Performance IEEE-488.2 Interface for PCI	***10-70***

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Data Acquisition and Control Tutorial & Software

PC-based Data Acquisition System Overview

In the last few years, industrial PC I/O interface products have become increasingly reliable, accurate and affordable. Because of this, PC-based data acquisition and control systems are now widely used in industrial and laboratory applications such as: monitoring, control, data acquisition and automated testing.

Selecting and building a DA&C (Data Acquisition and Control) system that actually does what you want it to do requires some knowledge of electrical and computer engineering. This tutorial gives a brief introduction to what DA&C systems do and how to configure them. It covers:

- Transducers and Actuators
- Signal Conditioning
- Data Acquisition and Control Hardware
- Getting Started
- Computer System Software

Transducers and Actuators

A transducer converts temperature, pressure, level, length, position, etc. into voltage, current, frequency, pulses or other signals.

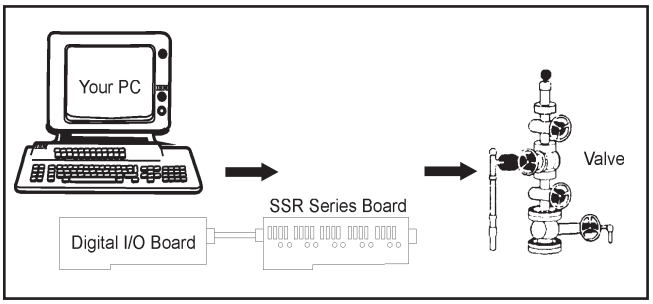
Thermocouples, thermistors and resistance temperature detectors (RTDs) are common transducers for temperature measurements. Other types of transducers include flow sensors, pressure sensors, strain gauges, load cells and LVDTs, which measure flow rate, pressure variances, force or displacement.

An actuator is a device that activates process control equipment by using pneumatic, hydraulic or electrical power. For example, a valve actuator can open and close a valve to control fluid rates.

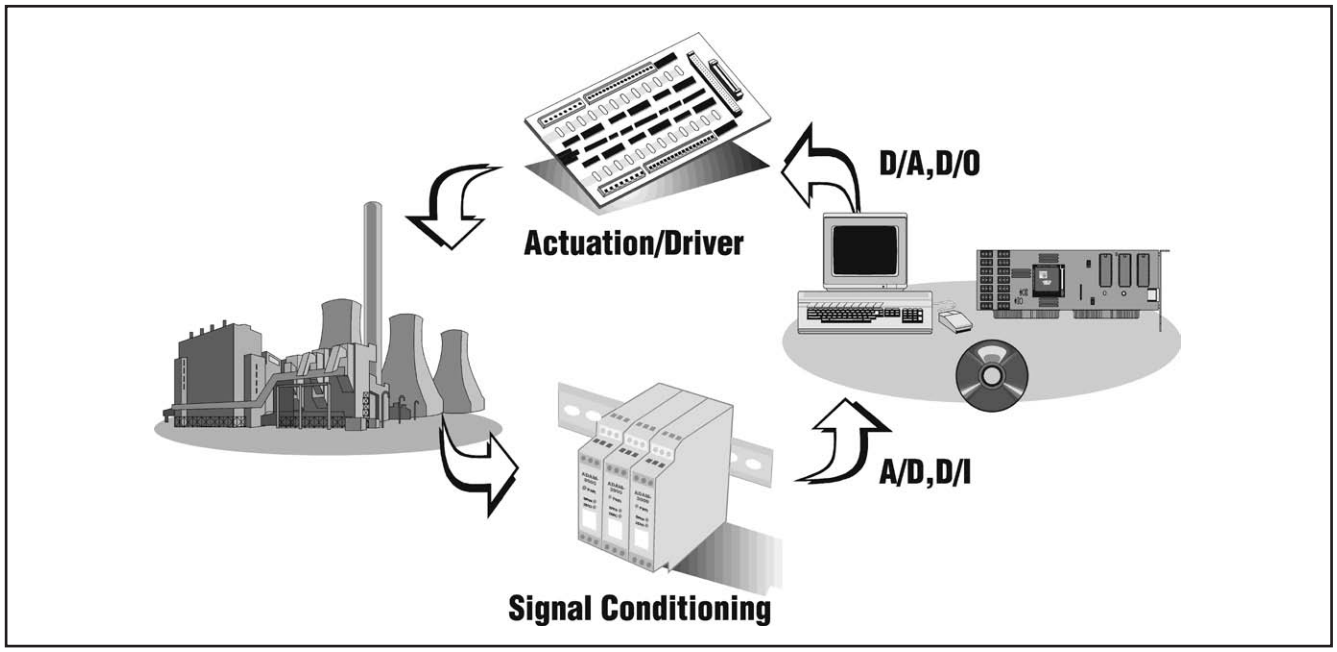
Signal Conditioning

Signal conditioning circuits improve the quality of signals generated by transducers before they are converted into digital signals by the PC's data-acquisition hardware. Examples of signal conditioning are signal scaling, amplification, linearization, cold-junction compensation, filtering, attenuation, excitation, common-mode rejection, and so on.

One of the most common signal conditioning functions is amplification. For maximum resolution, the voltage range of the input signals should be approximately equal to the maximum input range of the A/D converter. Amplification expands the range of the transducer signals so that they match the input range of the A/D converter. For example, a x10 amplifier maps transducer signals that range from 0 to 1 V into the range 0 to 10 V before they go into the A/D converter.



Using digital I/O and SSRs to open and close a valve



The layout of a typical PC-based data acquisition system

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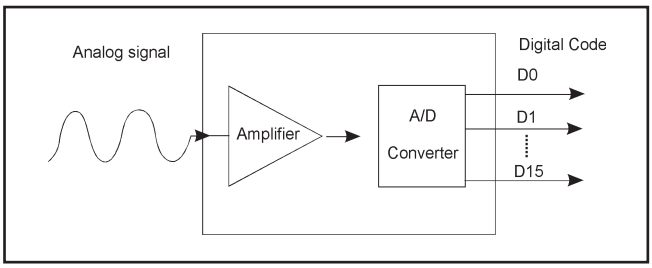
Data Acquisition & Control Hardware

Data acquisition and control hardware generally performs one or more of the following functions: analog input, analog output, digital input, digital output and counter/timer functions. This section will discuss each function and list some considerations that are important when you select a data acquisition and control system.

Analog Inputs (A/D)

Analog to digital (A/D) conversion changes analog voltage or current levels into digital information. The conversion is necessary to enable a computer to process or store the signals.

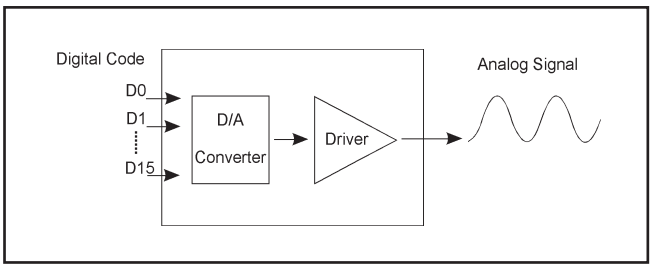


The most significant criteria when selecting A/D hardware are:

1. Number of input channels
2. Single-ended or differential input signals
3. Sampling rate (in samples per second)
4. Resolution (usually measured in bits of resolution)
5. Input range (specified in full-scale volts)
6. Noise and nonlinearity

Analog Outputs (D/A)

The opposite of analog to digital conversion is digital to analog (D/A) conversion. This operation converts digital information into analog voltage or current. D/A devices allow a computer to control real-world events.



Analog output signals may directly control process equipment. The process can give feedback in the form of analog input signals. This is referred to as a closed loop control system with PID control. Analog outputs can also be used to generate waveforms. In this case, the device behaves as a function generator.

Digital Inputs and Outputs

Digital input/output functions are useful in applications such as contact closure and switch status monitoring, industrial On/Off control and digital communications.

Counter/Timer

A counter/timer can be used for event counting, flowmeter monitoring, frequency counting, pulse width measurement, time period measurement, and so on.

Getting Started

Advantech: The source for what you need

Advantech manufactures data acquisition hardware and software for measurement, monitoring and applications control. The following guide is provided to help you choose components for your data acquisition system.

Step 1: Know your fundamental goal

Decide whether your DA&C system will be used primarily for measurement, monitoring, control, or analysis. Know the data requirements of your process, and know the number of data collection points in your system. Know the required data collection speed, the sampling rate, the type of measurement, the voltage or current being produced, the desired accuracy and the output resolution at each data collection point. Finally, know the timing of events in your system, and any special environmental conditions that exist.

Step 2: Hardware selection

Select the hardware required to achieve your fundamental goal. Advantech provides plug-in boards for Analog-to-Digital, Digital-to-Analog,Digital I/O, RS-232 or RS-485 needs. Both ISA and PCI bus products are available. Your hardware selection should be based on five major criteria:

1. Number and types of channels
2. Differential or single-ended inputs
3. Resolution
4. Speed
5. Software compatibility with hardware

Step 3: Accessory selection

Most applications require additional accessories which are available as separate items. These include:

1. Expansion peripherals to add channels to your system
2. Cables, signal conditioners and external boxes such as screw terminals or BNC accessories

Step 4: Software selection

More than any other single factor, software will determine your system start-up time, as well as its effectiveness, suitability for your application, and ease of modification.

Three major criteria should determine the choice of software:

1. Operating system used
2. User programming expertise
3. Software compatibility with hardware

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ActiveDAQ Pro Introduction

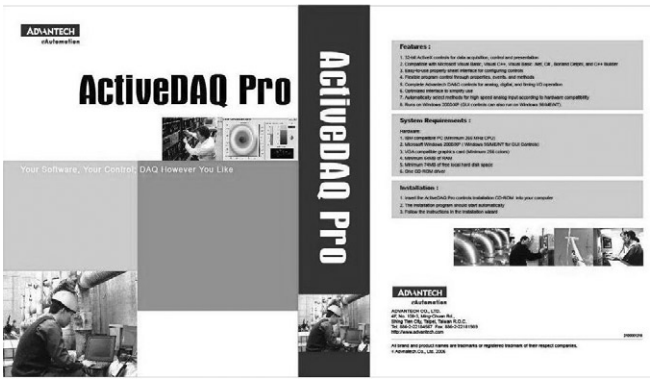
What is ActiveDAQ Pro ?

ActiveDAQ Pro is a collection of ActiveX controls for performing I/O operations within any compatible ActiveX control container, such as Visual Basic, Delphi, etc. You can easily perform the I/O operations through properties, events and methods. With ActiveDAQ Pro, you can perform versatile I/O operations to control your Advantech devices.

The ActiveDAQ Pro package contains the following components:

- Advantech ActiveDAQ Pro Device Control: Enumerate all ADVANTECH devices, direct I/O operation.
- Advantech ActiveDAQ Pro AI Control: Retrieve data from ADVANTECH AI device.
- Advantech ActiveDAQ Pro AO Control: Export data to ADVANTECH AO device.
- Advantech ActiveDAQ Pro DIO Control: Digital input/output operation.
- Advantech ActiveDAQ Pro Thermo Control: Retrieve temperature by thermocouple measurement.
- Advantech ActiveDAQ Pro Counter Control: Counter input signal.
- Advantech ActiveDAQ Pro Pulse Control: Pulse signal output.

You can use these ActiveX controls in any development tool that supports them, including Microsoft Visual C++, Microsoft Visual Basic, Borland C++ Builder, Borland Delphi and Microsoft Visual Studio .NET.



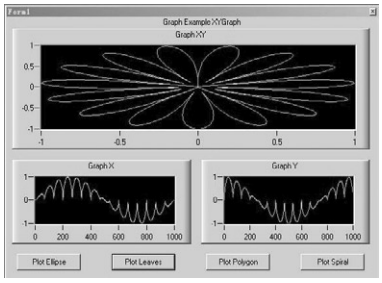
What's New in ActiveDAQ Pro ?

In the latest version of the ActiveDAQ series: ActiveDAQ Pro, efforts have been made to improve on the technical aspects and to provide a clear-cut mode of operation, as explained in the following summary:

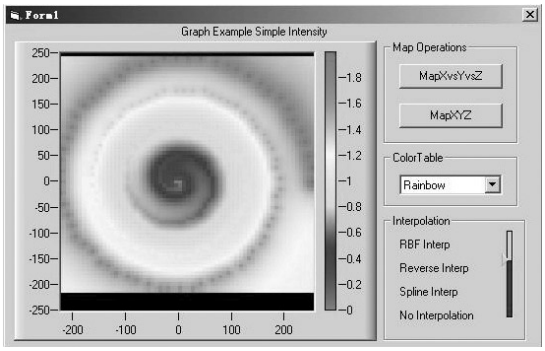
Graphic User Interface Control Components

Advantech ActiveDAQ Pro GUI control collection consists of abundant of graphic user interface (GUI) control components, which enable users to conveniently and quickly build graph display modules for data acquisition so as to supervise the changing status of the object. ActiveDAQ Pro GUI control collection also helps users easily develop prototype vision applications in an interactive environment without programming. These control components include:

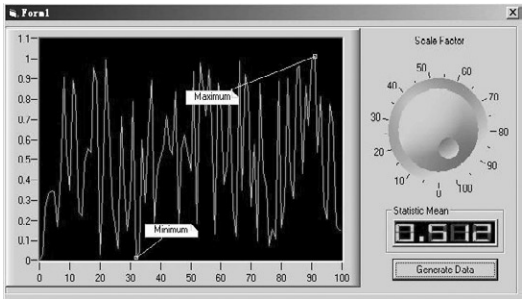
- **Button control:** It offers various display styles(2D and 3D) and is a Boolean control that displays an on or off state (True or False).
- **Graph control:** This control provides abundant graph display functions, which enable the user to displays data of various sources simultaneously.



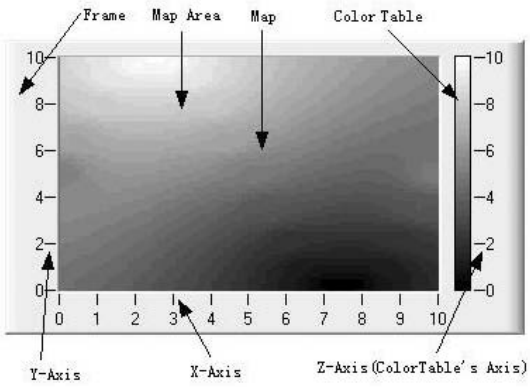
- **Intensity control:** It offers two-dimensional display and simple interpolation for scattered 3D data points so that the user can conveniently check the intensity variation trend of scattered 3D data points.



- **Knob control:** It is a circular data controlling control that provides various graph styles and can be used to display one or more values on the same interface.



- **LED control:** This control provides data display and editing functions with the seven-segment nixie tube mode. After the Formatstring has been chosen or defined by the user, the displayed value of the control will be adjusted automatically according to the FormatString and displayed in the text edit box.
- **NumEditor control:** This control provides the user with the functions of data displaying and editing. After the Formatstring has been chosen or defined by the user, the values of the control will be adjusted automatically according to the FormatString and displayed in the text edit box.
- **Slider control:** It is a linear data controlling control that provides various graph styles. A Slider control can be used to set or display one or more values.



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Supports all Advantech DAQ devices with high speed functions

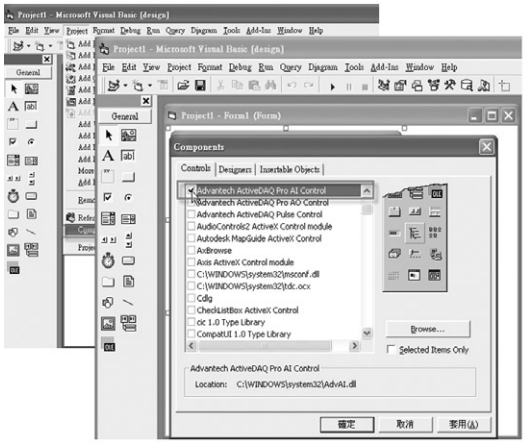
ActiveDAQ Pro now fully supports all Advantech DAQ cards and functions with complete high speed data acquisition, including AI (analog input), AO (analog output), DI/O (digital input/output) and counter cards. These high speed functions are preformed by interrupt and DMA data transfer which were previously excluded.

Easy-to-use property sheet interface for configuring controls

The property page will offer selections which will give easy access to all settings eliminate unnecessary programming. Programming will only be required in specialized situations.

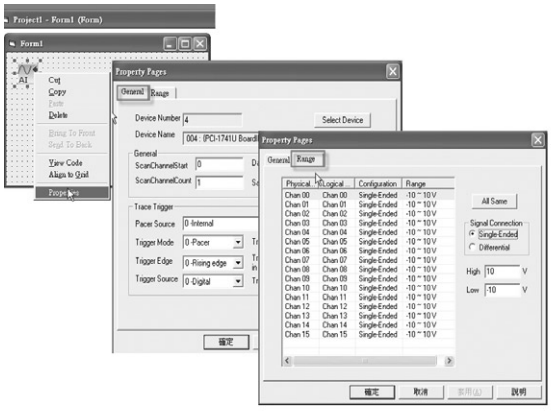
Independent operation of controls

ActiveDAQ Pro offers total independent control operation, needing no support from other existing controls.



Uses known physical properties

Physical properties like voltage, current and frequency can now be directly applied by the user and will automatically be reassigned to the data needed by GainCode and sampling rate. Making these changes has ensured that ActiveDAQ Pro has become much more user friendly.



Straightforward user interface

The new version has become less-hardware dependent and it has relied more on intuition during the user interface. During the redesigned process, the target was to decrease the development difficulties. It has become easier for both entry level and advanced level users to manage.

Uses optional lists instead of direct input

Now lists are provided with values which remain limited over various processes. This option is much more convenient to input and will eliminate a large portion of the direct data input.

Default settings for immediate execution

Proper default settings have now been added to all methods and properties. That means quicker execution for the user, which will offer a prompt response.

Properties and parameters are chosen automatically

When the user opts for some specific methods in ActiveDAQ Pro it can result automatically in appropriate properties and parameters. For example, ActiveDAQ Pro control can automatically determine an appropriate data transferring method to perform the data acquisition. (Software, interrupt and DMA transfer)

Parameter check-up and correction

Each input parameter has to be within a certain range. As a result it has to have check-up to ensure legitimacy. In most cases the user will be notified and in others there will be an automatic correction.

Better defined error messages and diagnostic guide

ActiveDAQ Pro offers clear error messages description and diagnostic guides for all return errors.

Supports all widely known development platforms

ActiveDAQ Pro support Microsoft Windows 2000 and Windows XP operation system.

As with the previous version, ActiveDAQ 1.6x, it continues to support all widely known development platforms based on ActiveX technolygy. These platforms include Microsoft Visual Basic, Visual C++, Visual Basic.Net, Visual C#, Borland C++ Builder and Delphi.

System Requirements

- IBM compatible PC using at least a 266 MHz or higher microprocessor
- Microsoft Windows 2K / XP
- VGA compatible graphics card, supporting at least 256 colors.
- Minimum 64 MB of RAM.
- 74MB of free local hard disk space.
- One CD-ROM driver

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Glossary

Accuracy

Accuracy is the deviation of a measurement from a known standard. Accuracy is normally specified in percent.

ADC - Analog-to-Digital Converter

ADC is used to convert DC voltage from transducers into digital words (data). The voltage represents a temperature. pressure, flow, pH, or speed and must converted to a digital word before it can be passed to an intelligent device like a computer.

Amplifier

Amplifiers are used to boost the analog level (voltage) of the signal.

AO - Analog Output

The D/A converter performs the opposite function of an A/D converter. It interprets commands from the computer and outputs the proper DC voltage or current. The output stays at this output level until the computer tells the D/A converter to output a new value.

Auto calibration

The built-in auto-calibration circuitry corrects gain and offset errors in analog input and analog output channels thereby eliminating the need for external equipment and user adjustments.

Automatic channel/gain/SD*/BU* scanning

Advantech's DA&C card's with this function feature an automatic channel/gain/SD/BU scanning circuit. This circuit controls multiplexer switching during sampling in a way that is more efficient than software implementation. Onboard SRAM stores different gain, SD and BU values for each channel. This combination lets users perform multi-channel high-speed sampling with different gain, SD and BU values for each channel.

*Note: SD: Single-Ended/Differential; BU: Bipolar/Unipolar

BoardID switch

BoardID DIP switch helps defines each card's unique identity when multiple identical PCI cards have been installed in the same computer. The BoardID switch is very useful when you build your system with multiple identical PCI cards. With the correct BoardID switch settings, you can easily identify and access each card during hardware configuration and software programming.

C/T - Counter/Timer

The counter card can be used to sense the presence or absence of a voltage, much like digital input card. The counter is used to count the number of electronic pulses (totalize), the duration of the pulse (pulse width), or the rate of pulses (frequency) coming out of an external device.

Channel-freeze

The channel-freeze function can be enabled either in dry contact or wet contact mode (selected by the onboard jumper). When the channel-freeze function is enabled, the last status of each digital output channel will be safely kept for emergency use. Moreover, you can enable this function through software as it is useful in software simulation and testing program.

C/T - Counter/Timer

The counter card can be used to sense the presence or absence of a voltage, much like digital input card. The counter is used to count the number of electronic pulses (totalize), the duration of the pulse (pulse width), or the rate of pulses (frequency) coming out of an external device.

Common Mode Noise

Electrical interference on both signal leads of an analog measurement which change simultaneously relative to ground. Common mode noise most often results when the ground potential between the measuring instrument and the device being measured are different. The difference in grounds results in a ground loop, a current flowing through ground and the low lead. Once this current appears in the low lead wire it will cause a voltage because the wire has some resistance. The longer the lead, the more lead resistance and greater the voltage error.

TIP : To reduce common mode noise, use a guarded voltmeter. Tie the guard to the low side of the device being measured. This will shunt any ground loop currents away from the high and low measurement wires.

DI - Digital Input

A digital input card is used to determine whether an external device is on or off by sensing the presence or absence of a voltage. The DI can only report ON/OFF status and not the value of the voltage on each channel (sometimes called a bit). The bit is considered to be ON if the voltage exceeds a certain value.

Digital cards are usually 8, 16, or 32 channels. They can monitor a number of devices. For example, a digital card can be attached to a single operator panel to sense the position of switches on that panel.

Digital filter

The digital filter function is used to eliminate glitches on input data and reduce the number of changes to examine and process. The filter blocks pulses that are shorter than the specified timing interval and passes pulses that are twice as long as the specified interval. Intermediate-length pulses that are longer than half of the interval, but less than the interval, may or may not pass the filter depending on your settings.

DMA - Direct Memory Access

A method of transferring data from or to memory at a high rate without involving the CPU.

DMA is the hardware/software technique that allows the highest speed transfer of data, to or form random memory (RAM) . Given the potentially more expensive hardware. DMA can provide the means to read or write data at precise times without restricting the microprocessor‘ tasks. For example, one system under DMA control can read or write any combination of analog, digital or counter/timer data to or from RAM at rates up to 360KB/second. This is accomplished without taking time from the other tasks of the microprocessor. The amount of time required to respond to a DMA request is very small compared to the time required to service an interrupt. This makes the goal of foreground/background operation, at high speed, possible.

DO - Digital Output

The digital output card interprets a command from the computer and outputs a high or low voltage on each of its channels (bits). It is commonly used to turn on/off small lights or to send digital words to machinery.

FSR - Full Scale Range

Gain - Magnitude ratio

For a linear system or element, the ratio of the magnitude (amplitude) of a steady-state sinusoidal output relative to the causal input; the length of a phasor form the origin to a point of the transfer locus in a complex plane.

GPIB - General Purpose Interface/Instrument Bus

A standard for IEEE-488 communication interface.

Interrupts data transfer

Interrupts to provide a means of tightly controlling the timing of events, while allowing the processing of more than one task. Multitasking systems are also known as “foreground/background” systems. One way of putting data acquisition in the background, is to relegate it to an interrupt routine. The clock or external timing signal, rather than being polled continuously, is used to generate an interrupt to the computer. Whenever the interrupt occurs, the computer suspends current activity, and executes an “interrupt service routine”. The interrupt service routine in this case might be a short program which acquires one frame of data, and stores it in memory. The computer can perform other operations in the foreground while collecting data in the background. Whenever a clock tick or external interrupt occurs, the computer will automatically stop the foreground processing, acquire

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the data, and then resume where it left off.

The reaction speed of the interrupt system is much higher than that of a polling loop. Speed, for a PC, is about 10K ~ 30K Hz in the interrupt mode.

Isolation protection

Isolation circuits are used to protect sensitive measurement circuitry from interference currents or voltages. These circuits are useful when the external voltage (from a transducer) is different than expected by the measurement hardware.

Keeping the output values after system reset

When the system is hot reset (power is not shut off), the Advantech's DA&C cards with this function can either retain the last digital (or analog) output values, or return to its default configuration, depending on jumper setting. This practical function eliminates danger caused by misoperation during unexpected system reset.

LSB - Least Significant Bit

Onboard FIFO memory

FIFO is the abbreviation of "First-In, First-Out". It functions as a "buffer" memory, which plays an important role in the data acquisition device. You can either enable or disable the interrupt request of the FIFO buffer. While the interrupt request for FIFO is enabled, you can further specify whether the interrupt request will be sent whenever one sampling takes place or when the FIFO buffer is half saturated. Advantech's data acquisition cards with onboard FIFO memory enables a continuous high-speed data transfer with more predictable performance on Windows systems.

Onboard programmable counter

Advantech's multifunction cards provide a programmable counter to generate a pacer trigger for the A/D conversion. The counter chip is an 82C54 or equivalent, which includes three 16-bit counters on a 10 MHz clock. One counter is used as an event counter for counting events coming from the input channels. The other two are cascaded together to make a 32-bit timer for a pacer trigger.

Optical isolators

Optical isolators are used with digital circuitry to shield high voltage signals from affecting digital circuitry

PCI-Bus mastering data transfer

Advantech's high-speed DA&C cards support PCI-Bus mastering DMA for high-speed data transfer and gap-free analog input and analog output. By setting aside a block of memory in the PC, the DA&C cards performs bus-mastering data transfers without CPU intervention, setting the CPU free to perform other more urgent tasks such as data analysis and graphic manipulation. The function allows users to run all I/O functions simultaneously at full speed without losing data.

Plug & Play function

PCI-1711 and PCI-1711L fully comply complies with the PCI Specification Rev 2.2 and thus are Plug & Play devices. During card installation, it is virtually unnecessary to set any jumpers or DIP switches. Instead, all bus-related configurations such as base I/O address and interrupts are conveniently taken care of by the Plug & Play function.

Polling

Polling is the simplest method for detecting a unique condition and then taking action. This involves a software loop that contains all of the required measurement, analysis, decision-making algorithms and planned actions. The data acquisition program periodically tests the system's clock or external trigger input to sense a transition. Whenever a transition occurs, the program then samples each of the inputs and stores their values in a "frame". A frame is simply a list that contains the values representing the specified inputs at a given time. The frames can be stored in RAM, disk or other types of memory. Each time the program senses a clock "tick", the inputs are scanned and converted, and a new frame is added to memory. In this mode, generic PC/AT's can support an acquisition rate of about 10Khz.

In addition, the PC is continuously busy when the polling loop is operational, and hence no other tasks can be serviced. When an application cannot tolerate these characteristics, interrupt techniques may be needed.

Programmable Power-Up States

With this function, all output lines are user-configurable for logic high or logic low when the system is powering up. User-configurable power-up states are useful for ensuring that the data acquisition card powers up in a known state. Power-up states are programmed in the EEPROM through the driver. The default settings are all set to 0.

PWM - Pulse width modulation

Pulse width modulation (PWM) technology is widely used for industrial applications such as measurement, motor control, power control and so on. It offers a simple way for digital control logic to create an analog equivalence. By using Advantech's high-resolution counter cards, the duty cycle of a square wave could be modulated to encode some specific analog signal levels so they can be used to control many electronic devices.

Resolution

Resolution is the smallest change that a measurement instrument can sense. Resolution is normally specified in bits.

S.E. Input - Single Ended Input

A single-ended configuration is best when you need to make analog measurements with respect to a common external ground. This configuration is also appropriate when there is no practical way to bring both a signal ground and an analog ground (AGND) back to the system's input terminals.

Shielding

An extra layer of conductive material surrounding a wire to prevent external electrical signals from interfering with the signal on the wire.

SPDT relay - Single-Pole Dual-Throw relay

SPST relay - Single-Pole Single-Throw relay

TTL - Transistor Transistor Logic

Watchdog Timer

The watchdog timer is a software-configurable feature used to set critical outputs to safe states in the event of a software failure. It will activate if there is a loss of communication between the application and the data acquisition card. If the card does not receive a watchdog clear software command within the interval time specified for the watchdog timer, the outputs go to a user-defined safe state and remain in that state until the watchdog timer is disabled and new values are written by the software.

After the watchdog timer expires, the card ignores any writes until the watchdog timer is disabled. Users can set the watchdog timer timeout period through WDT register to specify the amount of time that must elapse before the watchdog timer expires. The counter on the watchdog timer is configurable up to (232-1) x 100 ns (approximately seven minutes) before it expires.

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Analog I/O & Multifunction Cards

Category			Multifunction						
Bus			PCI						
Model			PCI-1710/1710L	PCI-1710HG/ 1710HGL	PCI-1711/1711L	PCI-1712/17112L	PCI-1716/1716L	PCI-1718HDU/ HGU	PCI-1741U
Analog Input	General Spec.	Resolution	12 bits	12 bits	12 bits	12 bits	16 bits	12 bits	16 bits
		Channels	16 SE/8 Diff.	16 SE/8 Diff.	16 SE	16 SE/8 Diff.	16 SE/8 Diff.	16 SE/8 Diff.	16 SE/8 Diff.
		Onboard FIFO	4096 samples	4096 samples	1024 samples	1024 samples	1024 samples	1024 samples	1024 samples
		Smapling Rate	100 kS/s	100 kS/s	100 kS/s	1 MS/s	250 kS/s	100 kS/s	200 kS/s
		Auto Channel Scanning	✓	✓	✓	✓	✓	✓	✓
	Input Ranges	Unipolar Inputs (V)	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 1, 0 ~ 0.1, 0 ~ 0.01	-	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25 (PCI-1718HDU) 0 ~ 10, 0 ~ 1, 0 ~ 0.1, 0 ~ 0.01 (PCI-1718HGU)	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25**
		Bipolar Inputs (V)	±10, 5, 2.5, 1.25, 0.625	±10, 5, 1, 0.5, 0.1, 0.05, 0.01, 0.005	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625 (PCI-1718HDU) ±10, 5, 1, 0.5, 0.1, 0.05, 0.01, 0.005 (PCI-1718HGU)	±10, 5, 2.5, 1.25, 0.625**
		Configurable Per-Channel	✓	✓	✓	✓	✓	✓	-
	Trigger Mode	Pacer/Software/ External Pulse	✓	✓	✓	✓	✓	✓	✓
		Analog Slope	-	-	-	✓	-	-	-
		Pretrigger	-	-	-	✓	-	-	-
		Post-trigger	-	-	-	✓	-	-	-
		About-trigger	-	-	-	✓	-	-	-
	Data Transfer Mode	Software	✓	✓	✓	✓	✓	✓	✓
		DMA	-	-	-	Bus-mastering	Bus-mastering	-	-
Analog Output		Resolution	12 bits	12 bits	12 bits	12 bits	16 bits	12 bits	16 bits
		Number of Channels	2 (PCI-1710 only)	2 (PCI-1710HG only)	2 (PCI-1711 only)	2 (PCI-1712 only)	2 (PCI-1716 only)	1	1
		Onboard FIFO	-	-	-	32 K samples	-	-	-
		Output range (V)	0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10, ±5, ±10	0 ~ 5, 0 ~ 10, ±5, ±10	0 ~ 5, 0 ~ 10	±5, ±10
		Throughput	Static update	Static update	Static update	1 MS/s	Static update	Static update	Static update
		DMA transfer	-	-	-	✓	-	-	-
Digital I/O		Input Channels	16	16	16	16 (mixed)	16	16	16
		Output Channels	16	16	16		16	16	16
Timer/Counter		Channels	1	1	1	3	1	1	1
		Resolution	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit
		Time Base	10 MHz	10 MHz	10 MHz	10 MHz	10 MHz	10 MHz	10 MHz
Isolation Voltage			-	-	-	-	-	-	-
Auto Calibration			-	-	-	✓	✓	-	✓
BoardID Switch			✓	✓	-	-	✓	✓	✓
Dimensions (mm)			175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100
Connector			68-pin SCSI-II	68-pin SCSI-II	68-pin SCSI-II	68-pin SCSI-II	68-pin SCSI-II	DB-37	68-pin SCSI-II
Windows 98/2000/XP DLL Driver			✓	✓	✓	✓	✓	✓	✓
Windows 98/2000/XP Test Utility			✓	✓	✓	✓	✓	✓	✓
VC++, VB & delphi Examples			✓	✓	✓	✓	✓	✓	✓
Advantech ActiveDAQ/ActiveDAQ Pro			✓	✓	✓	✓	✓	✓	✓
Labview I/O Drivers (Ver. 6i and 7.0)			✓	✓	✓	✓	✓	✓	✓
Mathworks MATLAB Data Acquisiton Tool Box 2.5.1			✓	✓	✓	✓	-	-	-
KW Win32 Driver			✓	✓	✓	-	✓	-	-
Page			10-12	10-12	10-14	10-16	10-18	10-20	10-22

* Note: SS = Single DMA channel, Single A/D channel scan SM = Single DMA channel, Multiple A/D channel scan

** Note: All channels should be set to the same range.

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Multifunction									AI		
PCI	ISA					PC/104			PCI		
PCI-1742U	PCL-711B	PCL-812PG	PCL-818L	PCL-818HD	PCL-818HG	PCM-3718H	PCM-3718HG	PCM-3718HO	PCI-1713	PCI-1714	PCI-1714UL
16 bits	12 bits	12 bits	12 bits	12 bits	12 bits	12 bits	12 bits	12 bits	12 bits	12 bits	12 bits
16 SE/8 Diff.	8 SE	16 SE	16 SE/8 Diff	16 SE/8 Diff	16 SE/8 Diff	16 SE/8 Diff.	16 SE/8 Diff.	16 SE/8 Diff.	32 SE/16 Diff. (Isolation)	4 SE	4 SE
1024 samples	-	-	-	1024 samples	1024 samples	-	-	1024 samples	4096 samples	32,768 samples	8,192 samples
1 MS/s	25 kS/s	30 kS/s	40 kS/s	100 kS/s	100 kS/s	100 kS/s	100 kS/s	100 kS/s*	100 kS/s	30 MS/s	10 MS/s
✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
0 ~ 10, 0 ~ 5 0 ~ 2.5, 0 ~ 0.125	-	-	-	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 1, 0 ~ 0.1, 0 ~ 0.01	0 ~ 10, 0 ~ 5 0 ~ 2.5, 0 ~ 0.125	0 ~ 10, 0 ~ 1 0 ~ 0.1, 0 ~ 0.01	0 ~ 10, 0 ~ 5 0 ~ 2.5, 0 ~ 0.125	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	-	-
±10, 5, 2.5, 1.25 0.625	±5, 2.5, 1.25, 0.625, 0.3125	±10, 5, 2.5, 1.25, 0.625, 0.3125	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625	±10, 5, 1, 0.5, 0.1, 0.05, 0.01, 0.005	±10, 5, 2.5, 1.25 0.625	±10, 5, 1, 0.5, 0.1, 0.05, 0.01, 0.005	±10, 5, 2.5, 1.25 0.625	±10, 5, 2.5, 1.25, 0.625	±5, 2.5, 1, 0.5	±5, 2.5, 1, 0.5
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-	-	-	-	-	-	-	-	-	-	✓	✓
-	-	-	-	-	-	-	-	-	-	✓	✓
-	-	-	-	-	-	-	-	-	-	✓	✓
-	-	-	-	-	-	-	-	-	-	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bus-mastering	-	SS*	SM*	SM*	SM*	SS*	SS*	SS*	-	Bus-mastering	Bus-mastering
16 bits	12 bits	12 bits	12 bits	12 bits	12 bits	-	-	12 bits	-	-	-
2	1	2	1	1	1	-	-	1	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
0 ~ 5, 0 ~ 10 ±5, ±10	0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10, ±10	0 ~ 5, 0 ~ 10, ±10	-	-	0 ~ 5, 0 ~ 10	-	-	-
Static Update	Static update	Static update	Static update	Static update	Static update	-	-	Static update	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
16	16	16	16	16	16	16	16	16	-	-	-
16	16	16	16	16	16				-	-	-
1	-	1	1	1	1	1	1	1	-	1	-
16 bits	-	16-bit	16-bit	16-bit	16-bit	16 bits	16 bits	16 bits	-	8-bit	1
10 MHz	2 MHz	2 MHz	10 MHz	10 MHz	10 MHz	10 MHz	10 MHz	10 MHz	-	60 MHz	60 MHz
-	-	-	-	-	-	-	-	-	2,500 V_{DC}	-	-
-	-	-	-	-	-	-	-	-	-	✓	✓
✓	-	-	-	-	-	-	-	-	-	✓	✓
175 x 100	175 x 100	185 x 100	155 x 100	185 x 100	185 x 100	96 x 90	96 x 90	96 x 90	175 x 100	175 x 100	175 x 100
68-pin SCSI-II	2 x 20-pin	2 x 20-pin	DB-37	DB-37	DB-37	2 x 20-pin	2 x 20-pin	2 x 20-pin	DB-37	4 BNC	4 BNC
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	-	-	-	✓	-	-
-	-	-	-	-	-	-	-	-	-	-	-
10-24	10-26	10-27	10-28	10-20	10-20	10-63	10-63	10-63	10-30	10-31	10-31

* 80kHz on P4-based (or upper) system

** Note: System-dependent

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Analog I/O & Multifunction Cards

Category			AI			AO								
Bus			PCI		ISA	PCI					ISA			PC./104
Model			PCI-1715U	PCI-1747U	PCL-813B	PCI-1720U	PCI-1721	PCI-1723	PCI-1724	PCI-1727U	PCL-726	PCL-727	PCL-728	PCM-3712
Analog Input	General Spec.	Resolution	12bits	16 bits	12 bits	-	-	-	-	-	-	-	-	-
		Channels	32 SE/16 Diff.	64 SE/32 Diff.	32 SE	-	-	-	-	-	-	-	-	-
		Onboard FIFO	1024 samples	1024 samples	-	-	-	-	-	-	-	-	-	-
		Smapling Rate	500 kS/s	250 kS/s	25 kS/s	-	-	-	-	-	-	-	-	-
		Auto Channel Scanning	✓	✓	-	-	-	-	-	-	-	-	-	-
	Input Ranges	Unipolar Inputs (V)	0 ~10, 0 ~ 5 0 ~ 2.5, 0 ~ 0.125	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	-	-	-	-	-	-	-	-	-
		Bipolar Inputs (V)	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625	-	-	-	-	-	-	-	-	-
		Configurable Per-Channel	✓	✓	✓	-	-	-	-	-	-	-	-	-
	Trigger Mode	Pacer/Software/ External Pulse	✓	Pacer/ Software	Software only	-	-	-	-	-	-	-	-	-
		Analog Slope	-	-	-	-	-	-	-	-	-	-	-	-
		Pretrigger	-	-	-	-	-	-	-	-	-	-	-	-
		Post-trigger	-	-	-	-	-	-	-	-	-	-	-	-
		About-trigger	-	-	-	-	-	-	-	-	-	-	-	-
	Data Transfer Mode	Software	✓	✓	Software only	-	-	-		-	-	-	-	-
		DMA	Bus-mastering	Bus-mastering	-	-	-	-	-	-	-	-	-	-
Analog Output		Resolution	-	-	-	12 bits	12 bits	16 bits	14 bits	14 bits	12 bits	12 bits	12 bits	12 bits
		Number of Channels	-	-	-	4 (Isolation)	4 (Waveform Output)	8	32	12	6	12	2 (Isolation)	2
		Onboard FIFO	-	-	-	-	1K samples	-	-	-	-	-	-	-
		Output range (V)	-	-	-	0 ~ 5, 0 ~ 10, ±5, ±10, 0 ~ 20 mA, 4 ~ 20 mA	0 ~ 5, 0 ~ 10, ±5, ±10, 0 ~ 20 mA, 4 ~ 20 mA	-10 ~ 10 0 ~ 20 mA, 4 ~ 20 mA	±10, 0 ~ 20 mA	0 ~ 5, 0 ~ 10 ±5, 4 ~ 20 mA	0 ~ 5, 0 ~ 10, ±5, ±10, 4 ~ 20 mA	-0 ~ 5, 0 ~ 10, ±5, 4 ~ 20 mA	0 ~ 5, 0 ~ 10, ±5, ±10, 0 ~ 20 mA, 4 ~ 20 mA	0 ~ 5, 0 ~ 10, ±5, ±10, 4 ~ 20 mA
		Throughput	-	-	-	Static update	10M	Static update	Static update	Static update	Static update	Static update	Static update	Static update
		DMA transfer	-	-	-	-	Bus-mastering	-	-	-	-	-	-	-
Digital I/O		Input Channels	-	-	-	-	16	16	-	16	16	16	-	-
		Output Channels	-	-	-	-				16	16	16	-	-
Timer/Counter		Channels	-	1	-	-	1	-	-	-	-	-	-	-
		Resolution	-	16-bit	-	-	16-bit	-	-	-	-	-	-	-
		Time Base	-	10 MHz	-	-	10 MHz	-	-	-	-	-	-	-
Isolation Voltage			2,500 V_{DC}	-	500 V_{DC}	2,500 V_{DC}	-	-	-	-	-	-	500 V_{DC}	-
Auto Calibration			-	✓	-	-	✓	✓	-	-	-	-	-	-
BoardID Switch			✓	✓	-	✓	✓	✓	✓	✓	-	-	-	-
Dimensions (mm)			175 x 100	175 x 100	219 x 100	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	337 x 112	337 x 112	185 x 120	96 x 90
Connector			DB-37	68-pin SCSI-II	DB-37	DB-37	68-pin SCSI-II	68-pin SCSI-II	DB-62	2 x 20-pin, DB-37	4 x 20-pin	2 x 20-pin, DB-37	2 x DB-9	1 x 10-pin box header
Windows 98/2000/XP DLL Driver			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 98/2000/XP Test Utility			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VC++, VB & delphi Examples			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Advantech ActiveDAQ/ActiveDAQ Pro			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Labview I/O Drivers (Ver. 6i and 7.1)			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mathworks MATLAB Data Acquisiton Tool Box 2.5.1			-	-	✓	✓	-	-	-	-	✓	✓	✓	-
KW Win32 Driver			-	-	-	-	-	-	-	-	-	-	-	-
Page			10-33	10-32	10-34	10-35	10-36	10-37	10-38	10-39	10-40	10-39	10-40	10-63

* Note: SS = Single DMA channel, Single A/D channel scan SM = Single DMA channel, Multiple A/D channel scan

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Digital I/O & Counter Cards

Category			Non-Isolated DI/O								
Bus			PCI							ISA	
Model			PCI-1735U	PCI-1737U	PCI-1739U	PCI-1751U	PCI-1753/1753E	PCI-1755	PCI-1757UP	PCL-720+	PCL-722
TTL DI/O	Input Channels		32	24	48	48	96	32	24	32	144
	Output Channels		32							32	
	Output Channel	Sink Current	0.5 V @ 24 mA	0.5 V @ 24 mA	0.5V @ 24 mA	24 mA @ 0.4 V	24 mA @ 0.44 V	48 mA @ 0.5 V	0.5 V @ 24 mA	24 mA @ 0.5 V	24 mA @ 0.5 V
		Source Current	2.0 V @ 15 mA	2.0 V @ 15mA	2.0 V @ 15 mA	15 mA @ 2.4 V	24 mA @ 3.76 V	15 mA @ 2.4 V	2.0 V @15 mA	3 mA @ 2.4 V	15 mA @ 2.4 V
Isolated DI/O	Input	Channels	-	-	-	-	-	-	-	-	-
		Isolation Voltage	-	-	-	-	-	-	-	-	-
		Input Range	-	-	-	-	-	-	-	-	-
	Output	Channels	-	-	-	-	-	-	-	-	-
		Isolation Voltage	-	-	-	-	-	-	-	-	-
		Output range	-	-	-	-	-	-	-	-	-
		Max. Sink Current	-	-	-	-	-	-	-	-	-
Timer/Counter		Channels	3	-	-	3	-	3	-	3	-
		Resolution	16 bits	-	-	16-bit	-	16-bit	-	16-bit	-
		Time Base	10 MHz	-	-	5 MHz	-	10 MHz	-	1 MHz	-
Advanced Function	Pattern Match		-	-	-	-	✓	✓	-	-	-
	Change of State		-	-	-	-	✓	✓	-	-	-
	BoardID Switch		✓	✓	✓	✓	✓	✓	✓	-	-
	Channel-Freeze Function		-	-	-	-	-	✓	-	-	-
	Output Status Read Back		✓	✓	✓	✓	✓	-	✓	-	-
	Dry/Wet Contact		-	-	-	✓	✓	-	✓	-	-
Dimensions (mm)			175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	120 x 65	185 x 100	334 x 100
Connectors			5 x 20-pin	1 x 50-pin	2 x 50-pin	68-pin SCSI-II	100-pin SCSI-II	100-pin SCSI-II	1 x DB-25	5 X 20- pin	6 x 50-pin
Windows 98/2000/XP DLL Driver			✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 98/2000/XP Test Utility			✓	✓	✓	✓	✓	✓	✓	✓	✓
VC++, VB & delphi Examples			✓	✓	✓	✓	✓	✓	✓	✓	✓
Advantech ActiveDAQ/ ActiveDAQ Pro			✓	✓	✓	✓	✓	-	✓	✓	✓
Labview I/O Drivers (Ver. 6i and 7.0)			✓	✓	✓	✓	✓	✓	✓	✓	✓
Mathworks MATLAB & Simulink Data Acquisiton Tool Box 2.5.1			-	-	-	✓	✓	-	-	✓	✓
KW Win32 Driver			-	-	-	-	-	-	-	-	-
Page			10-44	10-45	10-46	10-41	10-42	10-43	10-47	10-44	10-48

* Dry/wet contact can be mixed at the same time within one group.

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Digital I/O & Counter Cards

Category			Non-Isolated DI/O			Isolated DI/O									
Bus			ISA		PC/104	USB	PCI								
Model			PCL-724	PCL-731	PCM-3724	USB-4761	PCI-1730	PCI-1733	PCI-1734	PCI-1736UP	PCI-1750	PCI-1752	PCI-1754	PCI-1756	PCI-1758UDI	PCI-1758UDO
TTL DI/O	Input Channels		24	48	48	-	16	-	-	24	-	-	-	-	-	-
	Output Channels					-	16	-	-		-	-	-	-	-	-
	Output Channel	Sink Current	24 mA @ 0.4 V	24 mA @ 0.4 V	0.5 V @ 24 mA	-	8 mA @ 0.5 V	-	-	0.5 V @ 24 mA	-	-	-	-	-	-
		Source Current	15 mA @ 2.4 V	15 mA @ 2.4 V	2.0 V @ 15 mA	-	0.4 mA @ 2.4 V	-	-	2.0 V @ 15 mA	-	-			-	-
Isolated DI/O	Input	Channels	-	-	-	8 (Sink)	16 (Sink)	32 (Sink)	-	-	16 (Sink)	-	64 (Sink)	32 (Sink)	128	-
		Isolation Voltage	-	-	-	2,500 V_{DC}	2,500 V_{DC}	2,500 V_{DC}	-	-	2,500 V_{DC}	-	2,500 V_{DC}	2,500 V_{DC}	2500 V_{RMS}	-
		Input Range	-	-	-	5~30 V_{DC}	5 ~ 30 V_{DC}	5 ~ 30 V_{DC}	-	-	5 ~ 50 V_{DC}	-	10 ~ 50 V_{DC}	10 ~ 50 V_{DC}	5 ~ 25 V_{DC}	-
	Output	Channels	-	-	-	8 x Form C	16 (Sink)	-	32 (Sink)	-	16 (Sink)	64 (Sink)	-	32 (Sink)	-	128
		Isolation Voltage	-	-	-	2,500 V_{DC}	2,500 V_{DC}	-	2,500 V_{DC}	-	2,500 V_{DC}	2,500 V_{DC}	-	2,500 V_{DC}	-	2500 V_{RMS}
		Output Range	-	-	-	30 V_{DC} @ 1 A 240 V_{AC} @ 0.25 A	5 ~ 40 V_{DC}	-	5 ~ 40 V_{DC}	-	5 ~ 40 V_{DC}	5 ~ 40 V_{DC}	-	5 ~ 40 V_{DC}	-	5 ~ 40 V_{DC}
		Max. Sink Current	-	-	-		200 mA	-	200 mA	-	200 mA	200 mA	-	200 mA	-	90 mA
Timer/Counter		Channels	-	-	-	-	-	-	-		1	-	-	-	-	-
		Resolution	-	-	-	-	-	-	-		16-bit	-	-	-	-	-
		Time Base	-	-	-	-	-	-	-		1 MHz	-	-	-	-	-
Advanced Function	Pattern Match		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Change of State		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BoardID Switch		-	-	-	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓
	Channel-Freeze Function		-	-	-	-	✓	-	-	-	-	✓	-	✓	-	-
	Output Status Read Back		-	-	-	-	✓	-	✓	-	-	✓	-	✓	-	✓
	Dry/Wet Contact		-	-	-	-	✓	✓	-	-	✓	-	-	-	-	-
Dimensions (mm)			125 x 100	185 x 100	96 x 90	132 x 80	175 x 100	175 x 100	175 x 100	120 x 65	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100
Connectors			1 x 50-pin 2 x 20-pin	2 x 50-pin	2 x 50-pin	2 x opto-22 compatible box header	1 x DB-37 4 x 20-pin	1 x DB-37	1 x DB-37	1 x DB-44	1 X DB-37	100-pin SCSI-II	100-pin SCSI-II	100-pin SCSI-II	dual 100-pin mini-SCSI	dual 100-pin mini-SCSI
Windows 98/2000/XP DLL Driver			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 98/2000/XP Test Utility			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VC++, VB & delphi Examples			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Advantech ActiveDAQ/ ActiveDAQ Pro			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Labview I/O Drivers (Ver. 6i and 7.0)			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mathworks MATLAB & Simulink Data Acquisiton Tool Box 2.5.1			✓	✓	-	-	✓	✓	✓	-	✓	✓	✓	✓	-	✓
KW Win32 Driver			-	-	-	-	✓	✓	✓	-	-	✓	✓	✓	-	-
Page			10-45	10-46	10-63	10-71	10-49	10-50	10-51	10-55	10-52	10-53	10-53	10-53	10-54	10-54

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Isolated DI/O												Counter		
PCI					ISA					PC/104		PCI	ISA	PC/104
PCI-1758UDIO	PCI-1760U	PCI-1761	PCI-1762	PCI-1763UP	PCL-725	PCL-730	PCL-733	PCL-734	PCL-735	PCM-3725	PCM-3730	PCI-1780U	PCL-836	PCM-3780
-	-	-	-	-	-	16	-	-	-	8	16	8	16	24
-	-	-	-	-	-	16	-	-	-	8	16	8	16	
-	-	-	-	-	-	8 mA @ 0.5 V	-	-	-		0.5 V @ 8 mA	24 mA @ 0.5 V	8 mA @ 0.5 V	24 mA @ 0.5 V
-	-	-	-	-	-	0.4 mA @ 2.4 V	-	-	-		-0.4 mA @ 2.4 V	15 mA @ 2.4 V	0.4 mA @ 2.4 V	15 mA @ 2.0 V
64	8 (Sink)	8 (Sink)	8 (Sink)	8	8 (Sink)	16 (Sink)	32 (Sink)	-	-	8	8	-	-	-
2,500 V_{DC}	2,500 V_{DC}	2,500 V_{DC}	2,500 V_{DC}	2,500 V_{DC}	1,500 V_{DC}	2,500 V_{DC}	2,500 V_{DC}	-	-	2,500 V_{DC}	2,500 V_{DC}	-	-	-
5 ~ 25 V_{DC}	5 ~ 12 V_{DC}	10 ~ 50 V_{DC}	10 ~ 50 V_{DC}	10 ~ 50 V_{DC}	5 ~ 24 V_{DC}	5 ~ 24 V_{DC}	5 ~ 24 V_{DC}	-	-	10 ~ 50 V_{DC}	5 ~ 24 V_{DC}	-	-	-
64	8 x Form C	4 x Form A 4 x Form C	16 x Form C	8 x Form C	4 x Form A 4 x Form C	16 (Sink)	-	32 (Sink)	12 x Form C	8 x Form C	8	-	-	-
2,500 V_{DC}	2,500 V_{DC}	2,500 V_{DC}	2,500 V_{DC}	2,500 V_{DC}	1,000 V_{DC}	1,000 V_{DC}	-	1,000 V_{DC}	1,000 V_{DC}	2,000 V_{DC}	2,500 V_{DC}	-	-	-
5 ~ 40 V_{DC}	120 V_{AC} @ 0.5 A 30 V_{DC} @ 1 A	250 V_{AC} @ 3 A 24 V_{DC} @ 3 A	120 V_{AC} @ 0.5 A 30 V_{DC} @ 1 A	250 V_{AC} @ 3 A 24 V_{DC} @3A	120 V_{AC} @ 0.5 A 30 V_{DC} @ 1 A	5 ~ 40 V_{DC}	-	5 ~ 40 V_{DC}	0.6 A @ 100 V_{DC} 0.6 A @ 125 V_{DC}	240 V_{AC} @ 0.25 A 30 V_{DC} @ 1 A	5 ~ 40 V_{DC}	-	-	-
90 mA						200 mA	-	200 mA			200 mA		-	-
-	Up CTR for DI 2 X PWM	-	-	-	-	-	-	-	-	-	-	8 X CTR	6 X CTR 3 X PWM	2
-	16-bit (2,500 Isolation)	-	-	-	-	-	-	-	-	-	-	16-bit	16-bit	16 bits
-	500 Hz for Up CTR	-	-	-	-	-	-	-	-	-	-	20 MHz	10 MHz	20 MHz
-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-
-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-
✓	✓	✓	✓	✓	-	-	-	-	-	-	-	✓	-	-
-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-
✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
175 x 100	175 x 100	175 x 100	175 x 100	120 x 65	147 x 95	185 x 100	185 x 100	185 x 100	155 x 100	96 x 90	96 x 90	175 x 100	185 x 100	96 x 90
dual 100-pin mini-SCSI	1 X DB-37	1 X DB-37	1 x DB-62	1 x DB-44	1 x DB-37	1 x DB-37 4 x 20-pin	1 x DB-37	1 x DB-37	1 x DB-37	1 x 20-pin 1 x 50-pin	3 x 20-pin	68-pin SCSI-II	1 x DB-37 2 x 20-pin	1 x 50-pin 1 x 20-pin
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-	✓	✓	✓	-	✓	✓	✓	✓	✓	-	-	-	✓	-
-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-
10-54	10-58	10-57	10-59	10-56	10-57	10-49	10-50	10-51	10-60	10-64	10-64	10-62	10-61	10-64

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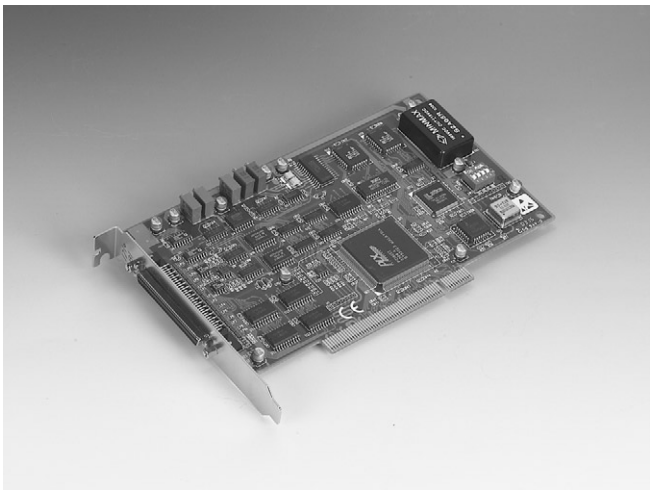
PCI-1710
PCI-1710HG

100 kS/s, 12-bit, PCI-bus Multifunction Card

100 kS/s, 12-bit, PCI-bus, High Gain, Multifunction Card



Features

- 16 single-ended, 8 differential or a combination of analog inputs
- 12-bit A/D converter, with up to 100 kHz sampling rate
- Programmable gain
- Automatic channel/gain scanning
- Onboard FIFO memory (4096 samples)
- Two 12-bit analog output channels
- 16 digital inputs and 16 digital outputs
- Onboard programmable counter
- BoardID™ switch

Introduction

The PCI-1710 Series are multifunction cards for the PCI bus. Their advanced circuit design provides higher quality and more functions, including the five most desired measurement and control functions: 12-bit A/D conversion, D/A conversion, digital input, digital output, and counter/timer.

Specifications

Analog Input

- **Channels** 16 single-ended/ 8 differential (SW programmable)
- **Resolution** 12 bits
- **Max. Sampling Rate*** 100 kS/s
- **FIFO Size** 4096 samples
- **Overvoltage Protection** ±30Vp-p
- **Input Impedance** 1 GΩ
- **Sampling Modes** Software, onboard programmable pacer, or external
- **Input Range** **(V, software programmable)**

PCI-1710/1710L					
Bipolar	±10	±5	±2.5	±1.25	±0.625
Unipolar	-	0 ~ 10	0 ~ 5	0 ~ 2.5	0 ~ 1.25
Accuracy (% of FSR ±1LSB)	0.1	0.1	0.2	0.2	0.4

PCI-1710HG/1710HGL								
Bipolar	±10	±5	±1	±0.5	±0.1	±0.05	±0.01	±0.005
Unipolar	-	0 ~ 10	-	0 ~ 1	-	0 ~ 0.1	-	0 ~ 0.01
Accuracy (% of FSR ±1LSB)	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.4

***Note:**
The sampling rate and throughput depends on the computer hardware architecture and software environment. The rates may vary due to programming language, code efficiency, CPU utilization and so on.

Analog Output (PCI-1710/1710HG only)

- **Channels** 2
- **Resolution** 12 bits
- **Output Rate** Static update
- **Output Range** **(V, software programmable)**

Internal Reference	**Unipolar**	0 ~ +5 V @ -5 V 0 ~ +10 V @ -10 V
External Reference		0 ~ +x V @ -x V (-10 ≤ x ≤ 10)

- **Slew Rate** 10 V/ms
- **Driving Capability** 3 mA
- **Operation Mode** Software polling
- **Accuracy** INLE: ±1/2 LSB, DNLE: ±1/2 LSB

Digital Input

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
Logic 1: 2.0 V min.

Digital Output

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.4 V max.
Logic 1: 2.4 V min.
- **Output Capability** Sink: 8.0 mA @ 0.8 V
Source: -0.4 mA @ 2.0 V

Pacer/Counter

- **Channels** 1
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 1 MHz

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Specifications Continued

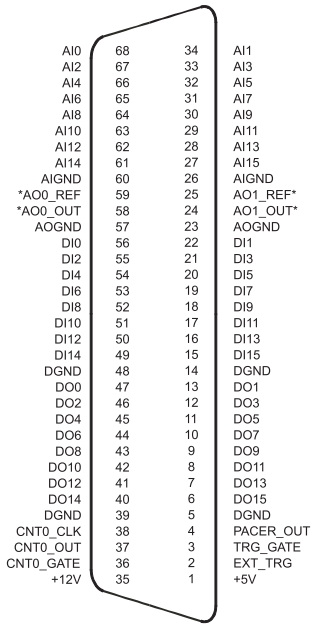
General

- **Bus Type** PCI V2.2
- **I/O Connector** SCSI-68P female x 1
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 850 mA
  Max: 5 V @ 1.0 A
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCI-1710** 100 kS/s, 12-bit multifunction card
- **PCI-1710L** 100 kS/s, 12-bit multifunction card without AO
- **PCI-1710HG** 100 kS/s, 12-bit high-gain multifunction card
- **PCI-1710HGL** 100 kS/s, 12-bit high-gain multifunction card without AO
- **PCLD-8710** SCSI-68 wiring terminal w/CJC, DIN-rail mount
- **PCLD-8710BNC** SCSI-68 wiring terminal w/CJC and BNC connectors, DIN-rail mount
- **PCL-10168-1** SCSI-68 Shielded Cable, 1 m
- **PCL-10168-2** SCSI-68 Shielded Cable, 2 m
- **ADAM-3968** SCSI-68 wiring terminal, DIN-rail mount

Pin Assignments



*: Pins 23~25 and pins 57~59 are not defined for PCI-1710L/1710HGL

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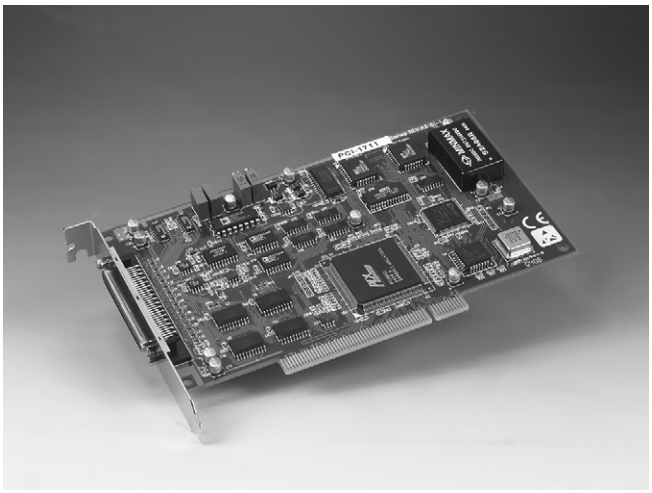
PCI-1711
PCI-1711L

100 kS/s, 12-bit, 16-ch S.E. Input Low-cost Multifunction Card

100 kS/s, 12-bit, 16-ch S.E. Input Low-cost Multifunction Card w/o AO function



Features

- 16 single-ended analog inputs
- 12-bit A/D converter, with up to 100 kHz sampling rate
- Programmable gain
- Automatic channel/gain scanning
- Onboard FIFO memory (1024 samples)
- Two 12-bit analog output channels (PCI-1711 only)
- 16 digital inputs and 16 digital outputs
- Onboard programmable counter

Introduction

PCI-1711 and PCI-1711L are powerful, but low-cost multifunction cards for the PCI bus. PCI-1711 comes with 2 analog output channels, while the PCI-1711L doesn't. Thus, PCI-1711L represents a cost saver for those that do not need analog output.

Specifications

Analog Input

- **Channels** 16 Single-ended
- **Resolution** 12 bits
- **Max. Sampling Rate*** 100 kS/s max.
- **FIFO Size** 1024 samples
- **Overvoltage Protection** 30 Vp-p
- **Input Impedance** 2 MΩ/5 pF
- **Sampling Modes** Software, onboard programmable pacer, or external
- **Input Range** **(V, software programmable)**

Bipolar	± 10	± 5	± 2.5	± 1.25	± 0.625
Accuracy (% of FSR ±1LSB)	0.1	0.1	0.2	0.2	0.4

***Note:**
The sampling rate and throughput depends on the computer hardware architecture and software environment. The rates may vary due to programming language, code efficiency, CPU utilization and so on.

Analog Output (only for PCI-1711)

- **Channels** 2
- **Resolution** 12 bits
- **Output Rate** Static update
- **Output Range** **(V, software programmable)**

Internal Reference	Unipolar	0 ~ +5 V, 0 ~ +10 V
External Reference		0 ~ +x V @ -x V (-10 ≤ x ≤ 10)

- **Slew Rate** 11 V/μs
- **Driving Capability** 3 mA
- **Output Impedance** 0.81 Ω
- **Operation Mode** Software polling
- **Accuracy** INLE: ±1/2 LSB
  DNLE: ±1/2 LSB

Digital Inputs

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.

Digital Outputs

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.8 V
  Logic 1: 2.0 V
- **Output Capability** Sink: 8.0 mA @ 0.8 V
  Source: -0.4 mA @ 2.0 V

Pacer/Counter

- **Channels** 1
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 10 MHz
- **Reference Clock** Internal: 10 MHz

General

- **Bus Type** PCI V2.2
- **I/O Connector** SCSI-68P female x 1
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption**
  PCI-1711: Typical: +5 V @ 850 mA
  Max: +5 V @ 1.0 A
  PCI-1711L Typical: +5 V @ 700 mA
  Max: +5 V @ 1.0 A
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH non-condensing (refer to IEC 68-2-3)

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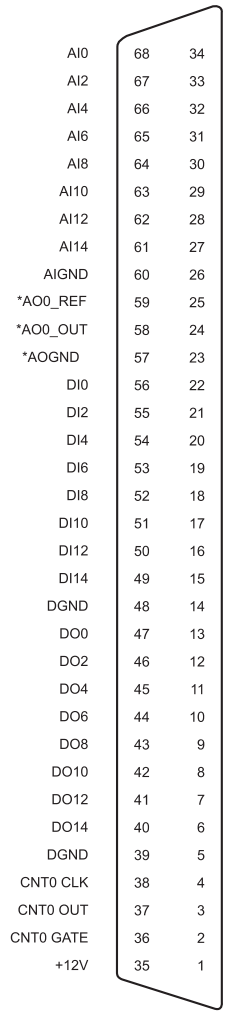
Ordering Information

- **PCI-1711** 100 kS/s, 12-bit multifunction card
- **PCI-1711L** 100 kS/s, 12-bit multifunction card without AO
- **PCLD-8710** SCSI-68 wiring terminal w/CJC, DIN-rail mount
- **PCLD-8710BNC** SCSI-68 wiring terminal w/CJC and BNC connectors, DIN-rail mount
- **PCL-10168-1** SCSI-68 shielded cable, 1 m
- **PCL-10168-2** SCSI-68 shielded cable, 2 m
- **ADAM-3968** SCSI-68 wiring terminal, DIN-rail mount

Pin Assignments



AI0	68	34	AI1
AI2	67	33	AI3
AI4	66	32	AI5
AI6	65	31	AI7
AI8	64	30	AI9
AI10	63	29	AI11
AI12	62	28	AI13
AI14	61	27	AI15
AIGND	60	26	AIGND
*AO0_REF	59	25	AOI_REF*
*AO0_OUT	58	24	AOI_OUT*
*AOGND	57	23	AOGND*
DI0	56	22	DI1
DI2	55	21	DI3
DI4	54	20	DI5
DI6	53	19	DI7
DI8	52	18	DI9
DI10	51	17	DI11
DI12	50	16	DI13
DI14	49	15	DI15
DGND	48	14	DGND
DO0	47	13	DO1
DO2	46	12	DO3
DO4	45	11	DO5
DO6	44	10	DO7
DO8	43	9	DO9
DO10	42	8	DO11
DO12	41	7	DO13
DO14	40	6	DO15
DGND	39	5	DGND
CNT0 CLK	38	4	PACER OUT
CNT0 OUT	37	3	TRG GATE
CNT0 GATE	36	2	EXT TRG
+12V	35	1	+5V

*: Pins 23~25 and pins 57~59 are not defined for PCI-1711L

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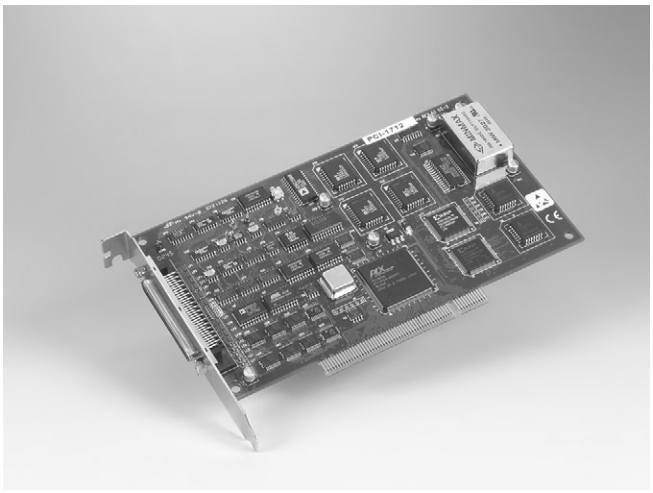
PCI-1712
PCI-1712L

1 MS/s, 12-bit High-speed Multifunction Card

1 MS/s, 12-bit High-speed Multifunction Card w/o AO function



Features

- 16 single-ended, 8 differential or a combination of analog inputs
- 12-bit A/D converter, with up to 1 MHz sampling rate
- Programmable gain
- Automatic channel/gain/SD*/BU* scanning
- Onboard FIFO memory (AI:1024 samples AO:32768 samples)
- Two 12-bit analog output channels with continuous waveform output function
- 16 digital input and output channels
- Three 16-bit programmable multifunction counter/timers on 10 MHz
- Auto-calibration (AI/AO)
- PCI-Bus mastering data transfer
- Pre-, post-, about- and delay-trigger data acquisition modes for analog input channels
- Onboard programmable multifunction counter/timer
- Continuous analog output (PCI-1712 only)
- Flexible triggering and clocking capabilities

Introduction

PCI-1712 and PCI-1712L are powerful high-speed multifunction cards for the PCI bus. They feature a 1 MHz 12-bit A/D converter, an onboard FIFO buffer (storing up to 1024 samples for A/D, and up to 32 K samples for D/A conversion). The PCI-1712 cards provide a total of up to 16 single-ended or 8 differential A/D input channels or a mixed combination, two 12-bit D/A output channels, 16 digital input/output channels, and three 10 MHz 16-bit multifunction counter channels. PCI-1712L is a low-cost version without analog output.

Specifications

Analog Input

- **Channels** 16 single-ended/ 8 differential (SW programmable)
- **Resolution** 12 bits
- **Max. Sampling Rate*** Multi-channel, single gain: 1 MS/s
  Multi-channel, multi gain: 600 kS/s
  Multi-channel, multi gain, unipolar/bipolar: 400 kS/s
- **FIFO Size** 1024 samples
- **Overvoltage Protection** 30 Vp-p
- **Input Impedance** 100 MΩ 10 pF (Off), 100 MΩ 100 pF (On)
- **Sampling Modes** Software, onboard Programmable Pacer or External
- **Input Range** **(V, software programmable)**

Unipolar	N/A	0 ~ 10	0 ~ 5	0 ~ 2.5	0 ~ 1.25
Bipolar	±10	±5	±2.5	±1.25	±0.625
Accuracy (% of FSR ±1LSB)	0.05	0.03	0.03	0.05	0.1

***Note:**
The sampling rate and throughput depends on the computer hardware architecture and software environment. The rates may vary due to programming language, code efficiency, CPU utilization and so on.

Analog Output

- **Channels** 2
- **Resolution** 12 bits
- **Output Rate** 1 MS/s
- **FIFO Size** 32768 samples
- **Output Range** **(V, software programmable)**

Internal Reference	**Bipolar**	±5, ±10
	Unipolar	0 ~ 5, 0 ~ 10
External Reference		0 ~ +x V @ +x V (-10 ≤ x ≤ 10) -x ~ +x V @ +x V (-10 ≤ x ≤ 10)

- **Slew Rate** 20 V/μs
- **Driving Capability** ±10 mA
- **Output Impedance** 0.1 Ωmax.
- **Operation Mode** Software polling, continuous output, waveform output
- **Accuracy** INLE: ±1 LSB
  DNLE: ±1 LSB (monotonic)

Digital Input

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.

Digital Output

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.
- **Output Capability** Sink: 8.0 mA @ 0.8 V
  Source: -0.4 mA @ 2.0 V

Pacer/Counter

- **Channels** 3
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 10 MHz
- **Reference Clock** Internal: 10 MHz, 1 MHz, 100 kHz, 10 kHz
  External Frequency: 10 MHz max.

General

- **Bus Type** PCI V 2.2
- **I/O Connector** SCSI-68P female x 1
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 850 mA, +12 V @ 600 mA
  Max: +5 V @ 1.0 A, +12 V @ 700 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 85° C (-4 ~ 185° F)
- **Storing Humidity** 5 ~ 95% RH non-condensing (refer to IEC 68-2-3)

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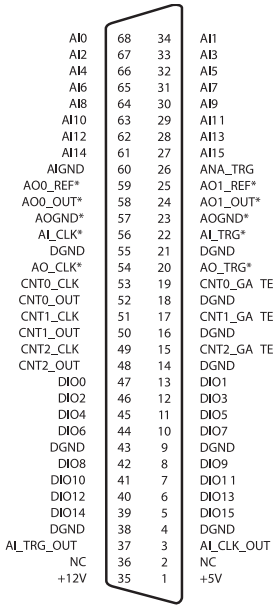
Ordering Information

- **PCI-1712** 1M S/s, 12-bit high-speed multifunction card
- **PCI-1712L** 1M S/s, 12-bit high-speed multifunction card without AO
- **PCLD-8712** Industrial Wiring Terminal Board for DIN-rail mounting
- **PCL-10168-1** SCSI-68 Shielded Cable, 1 m
- **PCL-10168-2** SCSI-68 Shielded Cable, 2 m
- **ADAM-3968** SCSI-68 wiring terminal, DIN-rail mount

Pin Assignments



*: Pin 20, 22~25, 54, 56~59 are not defined on PCI-1712L

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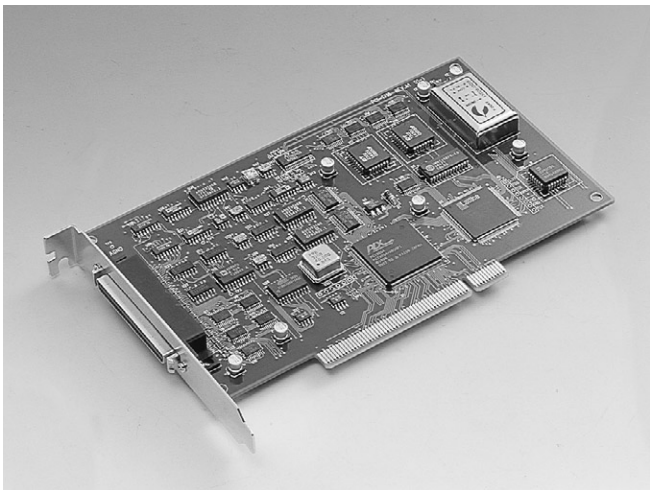
PCI-1716
PCI-1716L

250 kS/s, 16-bit High-Resolution Multifunction Card

250 kS/s, 16-bit High-Resolution Multifunction Card w/o AO Function



Features

- 16 single-ended, 8 differential or a combination of analog inputs
- 16-bit A/D converter, with up to 250 kHz sampling rate
- Onboard FIFO memory (1024 samples)
- Auto-calibration
- PCI-Bus mastering data transfer
- 2 analog output channels (PCI-1716 only)
- 16 digital inputs and 16 digital outputs
- Onboard programmable counter
- BoardID™ switch

Introduction

PCI-1716 and PCI-1716L are powerful high-resolution multifunction cards for the PCI bus. They feature a 250 kS/s 16-bit A/D converter, and an onboard 1K sample FIFO buffer for A/D. The cards can also have up to sixteen single-ended or eight differential A/D input channels or a combination of these; two 16-bit D/A output channels, 16 digital input/output channels, and one 10 MHz 16-bit counter channel. PCI-1716 and PCI-1716L provide specific functions for different user requirements.

Specifications

Analog Input

- **Channels** 16 single-ended/ 8 differential (SW programmable)
- **Resolution** 16 bits
- **Max. Sampling Rate*** 250 kS/s max.
- **FIFO Size** 1024 samples
- **Overvoltage Protection** 30 Vp-p
- **Input Impedance** Off: 100 MΩ/10 pF, On: 100 MΩ/100 pF
- **Sampling Modes** Software, onboard programmable pacer, or external
- **Trigger Modes** Pre-trigger, Post-trigger, Delay-trigger, About-trigger
- **Input Range** **(V, software programmable)**

Unipolar	N/A	0 ~10	0 ~5	0 ~2.5	0 ~1.25
Bipolar	± 10	± 5	± 2.5	± 1.25	± 0.625
Accuracy (% of FSR ±1LSB)	0.05	0.03	0.03	0.05	0.1

***Note**:
The sampling rate and throughput depends on the computer hardware architecture and software environment. The rates may vary due to programming language, code efficiency, CPU utilization and other factors.

Analog Output (PCI-1716 only)

- **Channels** 2
- **Resolution** 16 bits
- **Output Rate** Static update
- **Output Range** **(V, software programmable)**

Internal Reference	**Unipolar**	0 ~ 5 , 0 ~ 10
	Bipolar	±5 V, ±10 V
External Reference	0 ~ +x V @ +x V (-10 ≤ x ≤ 10) -x ~ +x V @ +x V (-10 ≤ x ≤ 10)	

- **Slew Rate** 20 V/μs
- **Driving Capability** ±20 mA
- **Output Impedance** 0.1 Ω max.
- **Operation Mode** Software polling
- **Accuracy** INLE: ±1 LSB

Digital Input

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.

Digital Output

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.4 V max.
  Logic 1: 2.4 V min.
- **Output Capability** Sink: 0.8 mA @ 0.8 V
  Source: -2.4 mA @ 2.0 V

Pacer/Counter

- **Channels** 1
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 1 MHz
- **Reference Clock** Internal: 10 MHz
  External Clock Frequency: 10 MHz max.

General

- **Bus Type** PCI V2.2
- **I/O Connector** SCSI-68P female x 1
- **Dimensions** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 850 mA, +12 V @ 600 mA
  Max.: +5 V @ 1 A, +12 V @ 700 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 158° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 85° C (-4 ~ 158° F)
- **Operating Humidity** 5 ~ 85% RH non-condensing(refer to IEC 68-1, -2, -3)
- **Storage Humidity** 5 ~ 95% RH non-condensing (refer to IEC 68-1, -2, -3)

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Ordering Information

- **PCI-1716** 250 kS/s, 16-bit high-resolution multifunction card
- **PCI-1716L** 250 kS/s, 16-bit high-resolution multifunction card without AO
- **PCLD-8710** SCSI-68 wiring terminal w/CJC, DIN-rail mount
- **PCLD-8710BNC** SCSI-68 wiring terminal w/CJC and BNC connectors, DIN-rail mount
- **PCL-10168-1** SCSI-68 Shielded Cable, 1 m
- **PCL-10168-2** SCSI-68 Shielded Cable, 2 m
- **ADAM-3968** SCSI-68 wiring terminal, DIN-rail mount

Pin Assignments

AI0	68	34	AI1
AI2	67	33	AI3
AI4	66	32	AI5
AI6	65	31	AI7
AI8	64	30	AI9
AI10	63	29	AI11
AI12	62	28	AI13
AI14	61	27	AI15
AIGND	60	26	AIGND
*AO0_REF	59	25	AO1_REF*
*AO0_OUT	58	24	AO1_OUT*
*AOGND	57	23	AOGND*
DI0	56	22	DI1
DI2	55	21	DI3
DI4	54	20	DI5
DI6	53	19	DI7
DI8	52	18	DI9
DI10	51	17	DI11
DI12	50	16	DI13
DI14	49	15	DI15
DGND	48	14	DGND
DO0	47	13	DO1
DO2	46	12	DO3
DO4	45	11	DO5
DO6	44	10	DO7
DO8	43	9	DO9
DO10	42	8	DO11
DO12	41	7	DO13
DO14	40	6	DO15
DGND	39	5	DGND
CNT0_CLK	38	4	PACER_OUT
CNT0_OUT	37	3	TRG_GATE
CNT0_GATE	36	2	EXT_TRG
+12V	35	1	+5V

*: Pins 23~25 and pins 57~59 are not defined for the PCI-1742U

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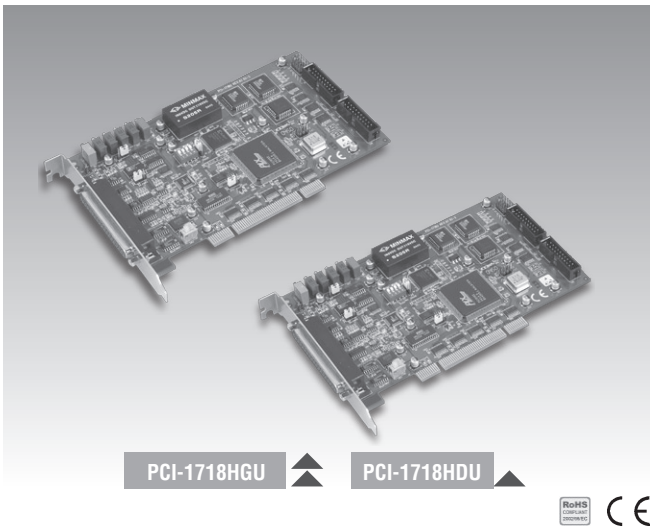
PCI-1718HDU
PCI-1718HGU

100 kS/s,12-bit, PCI Multifunction Card

100 kS/s, 12-bit High-Gain, PCI Multifunction Card



Features

- 16 single-ended or 8 differential analog inputs
- 12-bit A/D converter, with up to 100 kHz sampling rate
- Programmable gain
- Automatic channel/gain scanning
- Onboard FIFO memory (1024 samples)
- One 12-bit analog output channel
- 16 digital inputs and 16 digital outputs
- Universal PCI bus (support 3.3 V or 5 V PCI bus signal)
- BoardID™ switch

Introduction

The PCI-1718 series and the PCL-818H series are 100 kS/s multifunction data acquisition cards that offer the five most desired measurement and control functions: 12-bit A/D conversion, 12-bit D/A conversion, digital input, digital output, and counter/timer. With 3-way compatibility, migration is possible from ISA bus to PCI bus. The HG cards have the same specifications as the HD cards, but also offer a special high-gain programmable instrument amplifier for reading very low input signals.

Specifications

Analog Input

- **Channels** 16 single-ended/8 differential (SW programmable)
- **Resolution** 12 bits
- **Max. Sampling Rate** 100 kS/s
- **FIFO Size** 1024 samples
- **Overvoltage Protection** 30 Vp-p
- **Input Impedance** 100 MΩ
- **Sampling Modes** Software, onboard or external programmable pacer
- **Input Range**

PCI-1718HDU	Unipolar	N/A	0~10	0~5		0~2.5		0~1.25	
	Bipolar	±10	±5	±2.5		±1.25		±0.625	
	Accuracy (% of FSR ±1LSB)	0.1	0.1	0.2		0.2		0.4	
PCI-1718HGU	Unipolar	N/A	0~10	N/A	0~1	N/A	0~0.1	N/A	0~0.01
	Bipolar	±10	±5	±1	±0.5	±0.1	±0.05	±0.01	±0.005
	Accuracy (% of FSR ±1LSB)	0.1	0.1	0.2	0.2	0.4	0.4	0.8	0.8

Analog Output

- **Channels** 1
- **Resolution** 12 bits
- **Output Rate** Static Update
- **Output Range** **(V, software programmable)**

Internal Reference	Unipolar	0 ~ 5, 0 ~ 10
External Reference	PCI-1718H	0 ~ x V @ x V (-10 ≤ x ≤ 10)

- **Slew Rate** 10 V/μs
- **Driving Capability** ±10 mA
- **Output Impedance** 0.1 Ω max.
- **Operation Mode** Software polling
- **Accuracy** INLE: ±1/2 LSB

Digital Input

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max., Logic 1: 2 V min.

Digital Output

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.
- **Output Capability** Sink: 8.0 mA @ 0.8 V
  Source: -0.4 mA @ 2.0 V

Counter/Timer

- **Channels** 1
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 10 MHz
- **Reference Clock** Internal: 10 MHz
  External Clock Frequency: 10 MHz

General

- **Bus Type** Universal PCI 2.2
- **I/O Connector** DB-37P female x 1
  Box header 20P x 2
- **Dimensions** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 850 mA
  Max.: +5 V @ 1 A
- **Operating Temperature** 0 ~ 60 °C (32 ~ 158 °F)
- **Storing Temperature** -20 ~ 70 °C (-4 ~ 158 °F)
- **Operating Humidity** 5 ~ 85% RH non-condensing (refer to IEC 68-1,-2,-3)
- **Storing Humidity** 5 ~ 95% RH non-condensing (refer to IEC 68-1,-2,-3)
- **Certifications** CE

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Ordering Information

- **PCI-1718HDU** 12-bit multi-function card with PCI bus
- **PCI-1718HGU** 12-bit high-gain multi-function card with PCI bus
- **PCL-818HG** High-performance and High-gain multifunction card
- **PCL-10120-1** 20-pin flat cable, 1 m
- **PCL-10120-2** 20-pin flat cable, 2 m
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m
- **PCLD-8115** Industrial Wiring Terminal with CJC circuit and DB37 connector
- **PCLD-880** Industrial Wiring Terminal with DB37 connector

Pin Assignments

A/D S0	1	20	A/D S8
A/D S1	2	21	A/D S9
A/D S2	3	22	A/D S10
A/D S3	4	23	A/D S11
A/D S4	5	24	A/D S12
A/D S5	6	25	A/D S13
A/D S6	7	26	A/D S14
A/D S7	8	27	A/D S15
A.GND	9	28	A.GND
A.GND	10	29	A.GND
V.REF	11	30	DA0.OUT
S0*	12	31	DA0.VREF
+12 V	13	32	S1*
S2*	14	33	S3*
D.GND	15	34	D.GND
NC	16	35	EXT.TRIG
Counter 0 CLK	17	36	Counter 0 GATE
Counter 0 OUT	18	37	PACER
+5V	19		

CN1

D/O 0	1	2	D/O 1
D/O 2	3	4	D/O 3
D/O 4	5	6	D/O 5
D/O 6	7	8	D/O 7
D/O 8	9	10	D/O 9
D/O 10	11	12	D/O 11
D/O 12	13	14	D/O 13
D/O 14	15	16	D/O 15
D.GND	17	18	D.GND
+5 V	19	20	+12 V

CN2

D/I 0	1	2	D/I 1
D/I 2	3	4	D/I 3
D/I 4	5	6	D/I 5
D/I 6	7	8	D/I 7
D/I 8	9	10	D/I 9
D/I 10	11	12	D/I 11
D/I 12	13	14	D/I 13
D/I 14	15	16	D/I 15
D.GND	17	18	D.GND
+5 V	19	20	+12 V

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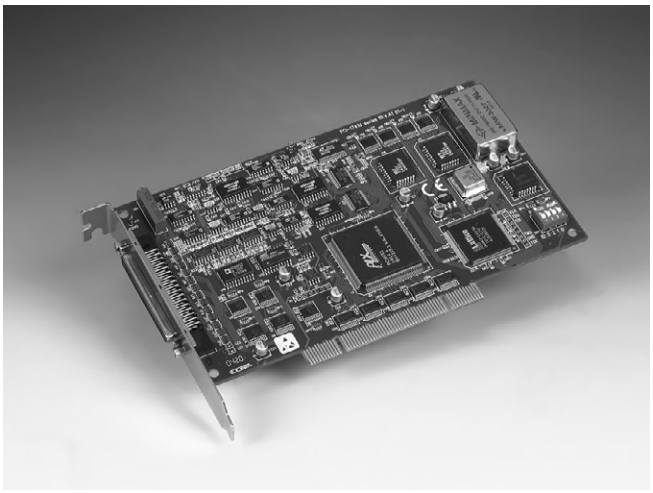
PCI-1741U

16-bit, 200 kS/s Low-Cost Multifunction Card w/AO



Features

- 16 single-ended, 8 differential or a combination of analog inputs
- 16-bit A/D converter, with up to 200 kHz sampling rate
- Onboard FIFO memory (1024 samples)
- Auto calibration
- Universal PCI bus (support 3.3 V or 5 V PCI bus signal)
- Onboard programmable counter
- BoardID™ switch

Introduction

PCI-1741U is a powerful high-resolution multifunction DAS card for the PCI bus. Its sampling rate is up to 200 kS/s and the 16-bit resolution makes it suitable for most data acquisition applications. PCI-1741U provides 16 single-ended or 8 differential analog input channels, one 16-bit D/A output channel, 16 digital input/output channels, and one 10 MHz 16-bit counter channel.

Specifications

Analog Input

- **Channels** 16 single-ended/8 differential (SW programmable)
- **Resolution** 16 bits
- **Max. Sampling Rate** 200 kS/s
- **FIFO Size** 1024 samples
- **Overvoltage Protection** 30 Vp-p
- **Input Impedance** 100 MΩ/10pF (Off); 100 MΩ/100pF (On)
- **Sampling Mode** Software, onboard programmable pacer or external
- **Input Range*** **(V, software programmable)**

Unipolar	N/A	0~10	0~5	0~2.5	0~1.25
Bipolar	±10	±5	±2.5	±1.25	±0.625
Accuracy (% of FSR ±1LSB)	0.03	0.02	0.02	0.03	0.04

* Note: All channels should be set to the same range

Analog Output

- **Channels** 1
- **Resolution** 16 bits
- **Output Rate** Static update
- **Output Range** **(V, software programmable)**

Internal Reference	**Bipolar**	±5, ±10
	Unipolar	0 ~ 5, 0 ~ 10
External Reference		0 ~ +xV @ +xV (-10 ≤ x ≤ 10) -x ~ +xV @ +xV (-10 ≤ x ≤ 10)

- **Slew Rate** 20 V/μs
- **Driving Capability** ±20 mA
- **Output Impedance** 0.1 Ω max.
- **Operation Mode** Software polling
- **Accuracy** INLE: ±1LSB

Digital Input

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
Logic 1: 2.0 V min.

Digital Output

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.8 V max.
Logic 1: 2.0 V min.
- **Output Capability** Sink: 24 mA @ 0.8 V
Source: -15 mA @ 2.0 V

Counter/Timer

- **Channels** 1
- **Compatibility** 5 V/TTL
- **Resolution** 16 bits
- **Max. Input Frequency** 10 MHz
- **Reference Clock** Internal: 10 MHz
External Clock Frequency: 10 MHz

General

- **Bus Type** Universal PCI 2.2
- **I/O Connector Type** SCSI-68P female x 1
- **Dimensions** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 850 mA, +12 V @ 600 mA
Max.: +5 V @ 1 A, +12 V @ 700 m A
- **Operating Temperature** 0 ~ 60° C (32 ~ 158° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 70 °C (-4 ~ 185 °F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)
- **Certifications** CE

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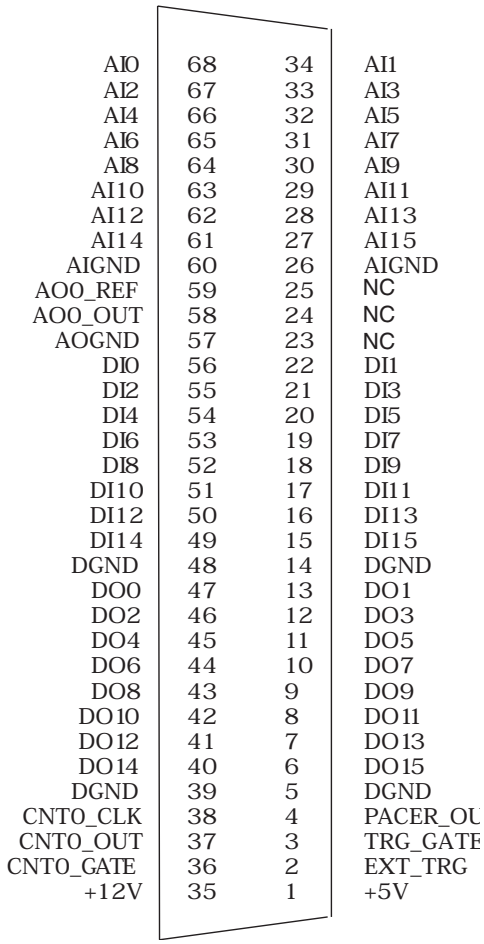
Ordering Information

- **PCI-1741U** 200k S/s, 16-bit high-resolution multifunction card
- **PCI-1741S** PCI-1741U with PCLD-8710 and PCL-10168 cable
- **PCL-10168-1** SCSI-68 Shielded Cable, 1 m
- **PCL-10168-2** SCSI-68 Shielded Cable, 2 m
- **ADAM-3968** SCSI-68 wiring terminal, DIN-rail mount
- **PCLD-8710** SCSI-68 wiring terminal w/CJC, DIN-rail mount
- **PCLD-8710BNC** SCSI-68 wiring terminal w/CJC and BNC connectors, DIN-rail mount

Pin Assignments



AI0	68	34	AI1
AI2	67	33	AI3
AI4	66	32	AI5
AI6	65	31	AI7
AI8	64	30	AI9
AI10	63	29	AI11
AI12	62	28	AI13
AI14	61	27	AI15
AIGND	60	26	AIGND
AO0_REF	59	25	NC
AO0_OUT	58	24	NC
AOGND	57	23	NC
DI0	56	22	DI1
DI2	55	21	DI3
DI4	54	20	DI5
DI6	53	19	DI7
DI8	52	18	DI9
DI10	51	17	DI11
DI12	50	16	DI13
DI14	49	15	DI15
DGND	48	14	DGND
DO0	47	13	DO1
DO2	46	12	DO3
DO4	45	11	DO5
DO6	44	10	DO7
DO8	43	9	DO9
DO10	42	8	DO11
DO12	41	7	DO13
DO14	40	6	DO15
DGND	39	5	DGND
CNT0_CLK	38	4	PACER_OU
CNT0_OUT	37	3	TRG_GATE
CNT0_GATE	36	2	EXT_TRG
+12V	35	1	+5V

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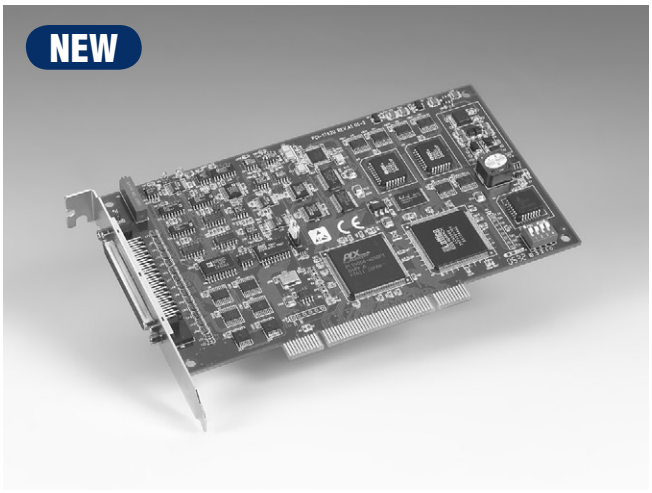
PCI-1742U

1 MS/s, 16-bit, 16-ch High-Resolution Multifunction Card



Features

- 16 single-ended, 8 differential or a combination of analog inputs
- 16-bit A/D converter, with up to 1 MHz sampling rate
- Onboard FIFO memory (1024 samples)
- Auto calibration
- Two 16-bit analog output channels
- 16 digital inputs and 16 digital outputs
- Onboard programmable counter
- Universal PCI Bus (support 3.3 V or 5 V PCI bus signal)
- BoardID™ switch

Introduction

PCI-1742U is a powerful high-resolution multifunction DAS card for the PCI bus. Its sampling rate of up to 1 MS/s and 16-bit resolution, fulfill the needs of most data acquisition applications. PCI-1742U provides 16 single-ended or 8 differential analog input channels, two 16-bit D/A output channels, 16 digital input/output channels, and one 10 MHz 16-bit counter channel.

Specifications

Analog Input

- **Channels** 16 single-ended /8 differential (SW programmable)
- **Resolution** 16 bits
- **Max. Sampling Rate** 1 MS/s single-channel
800kS/s multi-channel
250kS/s unipolar bipolar mixed
- **FIFO Size** 1024 samples
- **Overvoltage Protection**
- **Input Impendence** 100 MΩ/10pF (Off); 100 MΩ/100pF (On)
- **Sampling Mode** Software, onboard programmable pacer or external
- **Trigger Mode**
- **Input Range** **(V, Software programmable)**

Unipolar	N/A	0~10	0~5	0~2.5	0~1.25
Bipolar	±10	±5	±2.5	±1.25	±0.625

Analog Output

- **Channels** 2
- **Resolution** 16 bits
- **Output Rate** Static Update
- **Reference Clock**
- **Output Range** **(V, Software programmable)**

Internal Reference	**Bipolar**	-5~+5, -10~+10
	Unipolar	0~+5,0~+10
External Reference		0 ~ +x V @ +x V (-10 < x <10) -x ~ +x V @ +x V (-10 < x < 10)

- **Slew Rate** 40 V/μs
- **Driving Capability** ±20mA
- **Output Impendence** 0.1 Ω max.
- **Operation Mode** Single Output

Digital Input

- **Channels** 16
- **Capability** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
Logic 1: 2.0 V min.

Digital Output

- **Channels** 16
- **Capability** 5 V/TTL
- **Output Voltage** Logic 0: 0.8 V max.
Logic 1: 2.0 V min.
- **Output Capability** Sink: 0.5 V max. @ +24 mA
Source: 2.4 V min. @ -15 mA

Counter/Timer

- **Channels** 1
- **Compatibility** 5V/TTL
- **Resolution** 16 bits
- **Max. Input Frequency** 10 MHz
- **Reference Clock**

General

- **Bus Type** Universal PCI 2.2
- **I/O connector Type** 68-pin SCSI-II female
- **Dimensions** 175 mm × 100 mm (6.9" × 3.9")
- **Power Consumption** Typical: +5 V @ 850 mA, +12 V @ 600 mA
Max.: +5 V @ 1 A, +12 V @ 700m A
- **Operating Temperature** 0 ~ +60°C (32 ~ 158°F) (refer to IEC 68-2-1,2)
- **Storing Temperature** -20 ~ +85°C (-4 ~ 185°F)
- **Storing Humidity** 5 ~ 95%RH non-condensing (refer to IEC 68-2-3)
- **Certificates** CE

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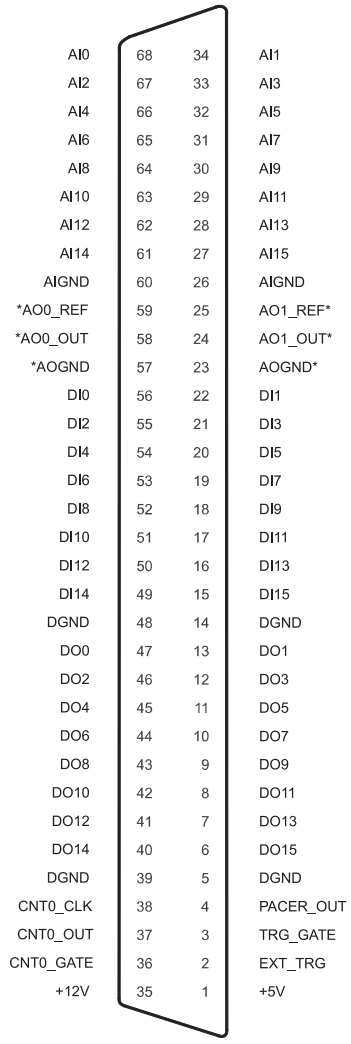
Ordering Information

- **PCI-1742U** 16-bit, 1MS/s Multifunction Card
- **PCL-10168** SCSI-68 Shielded Cable, 1 m
- **PCL-10168-2** SCSI-68 Shielded Cable, 2 m
- **ADAM-3968** SCSI-68 Wiring Terminal, DIN-rail Mount
- **PCLD-8710** SCSI-68 Wiring Terminal w/CJC, DIN-rail Mount
- **PCLD-8710BNC** SCSI-68 Wiring Terminal w/CJC and BNC connectors, DIN-rail Mount

Pin Assignments



AI0	68	34	AI1
AI2	67	33	AI3
AI4	66	32	AI5
AI6	65	31	AI7
AI8	64	30	AI9
AI10	63	29	AI11
AI12	62	28	AI13
AI14	61	27	AI15
AIGND	60	26	AIGND
*AO0_REF	59	25	AO1_REF*
*AO0_OUT	58	24	AO1_OUT*
*AOGND	57	23	AOGND*
DI0	56	22	DI1
DI2	55	21	DI3
DI4	54	20	DI5
DI6	53	19	DI7
DI8	52	18	DI9
DI10	51	17	DI11
DI12	50	16	DI13
DI14	49	15	DI15
DGND	48	14	DGND
DO0	47	13	DO1
DO2	46	12	DO3
DO4	45	11	DO5
DO6	44	10	DO7
DO8	43	9	DO9
DO10	42	8	DO11
DO12	41	7	DO13
DO14	40	6	DO15
DGND	39	5	DGND
CNT0_CLK	38	4	PACER_OUT
CNT0_OUT	37	3	TRG_GATE
CNT0_GATE	36	2	EXT_TRG
+12V	35	1	+5V

*: Pins 23~25 and pins 57~59 are not defined for the PCI-1742U

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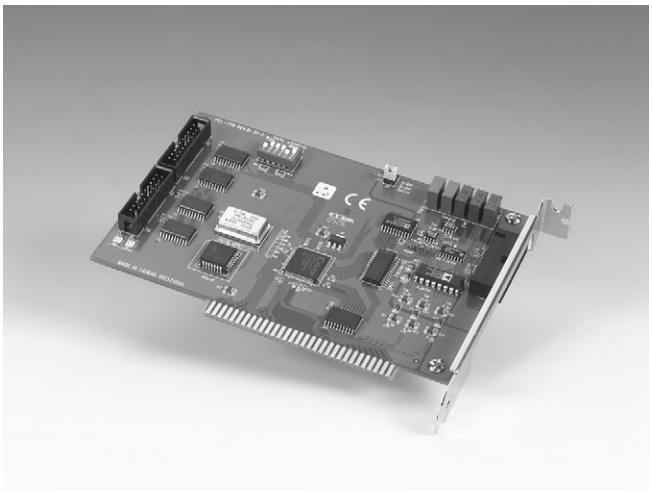
PCL-711B

40 kS/s, 12-bit, ISA-bus Multifunction Card



Features

- 8 single-ended analog inputs
- 12-bit A/D converter, with up to 40 kHz sampling rate
- Programmable gain
- One 12-bit analog output channel
- 16 digital inputs and 16 digital outputs
- Screw-terminal board and cable included

Introduction

PCL-711 offers four of the most popular I/O functions for PC/AT and compatible systems: A/D conversion, D/A conversion, digital input and digital output. The inexpensive PCL-711 is ideal for entry level applications. The features of this half-sized card include: eight 12-bit analog inputs, one 12-bit analog output, 16 digital inputs and 16 digital outputs. In addition, it comes with a 20-point screw-terminal board and a flat cable connector. PCL-711 performs a variety of I/O jobs, and features solid software support and a large selection of available daughterboards and accessories. It is an ideal and affordable performer for OEMs, schools and hobbyists who require a combination of analog and digital I/O.

Specifications

Analog Input

- **Channels** 8 single-ended
- **Resolution** 12 bits
- **Max. Sampling Rate** 40 kS/s
- **FIFO Size** 0
- **Overvoltage Protection** ±30 V_{DC}
- **Input Impedance** >10 MΩ
- **Sampling Modes** Software, pacer or external trigger
- **Input Range (V)** ±5, ±2.5, ±1.25, ±0.625, ±0.3125
- **Accuracy** ±2 LSB

Analog Output

- **Channels** One double-buffered channel
- **Resolution** 12 bits
- **Output Rate** Static Update
- **Output Range** 0 ~ 5 V or 0 ~ 10 V
- **Driving Capability** 10 mA

Digital Input

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8V max.
Logic 1: 2.0V min.

Digital Output

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.8 V max.
Logic 1: 2.0 V min.
- **Output Capability** Sink: 8 mA
Source: 0.4 mA

General

- **Bus Type** ISA
- **I/O Connectors** Box header 20P x 3
- **Dimensions (L x H)** 155 x 100 mm (6.1" x 3.9")
- **Power Consumption** +5 V @ 500 mA typical, 1.0 A max.
+12 V @ 50 mA typical, 100 mA max.
-12 V @ 14 mA typical, 20 mA max.
- **Operating Temperature** 0 ~ 50° C (32 ~ 122° F)
- **Storing Temperature** -20 ~ 65° C (-4 ~ 149° F)
- **Storing Humidity** 5 ~ 95% RH non-condensing (refer to IEC 68-2-3)
- **Certifications** CE

Ordering Information

- **PCL-711S** PCL-711B card, user's manual, driver CD-ROM, PCLD-7115 and 1 m 20-pin flat cable (PCL-10120-1)
- **PCL-711B** 40kS/s, 12-bit multifunction card
- **PCL-10120-1** 20-pin flat cable, 1 m
- **PCL-10120-2** 20-pin flat cable, 2 m

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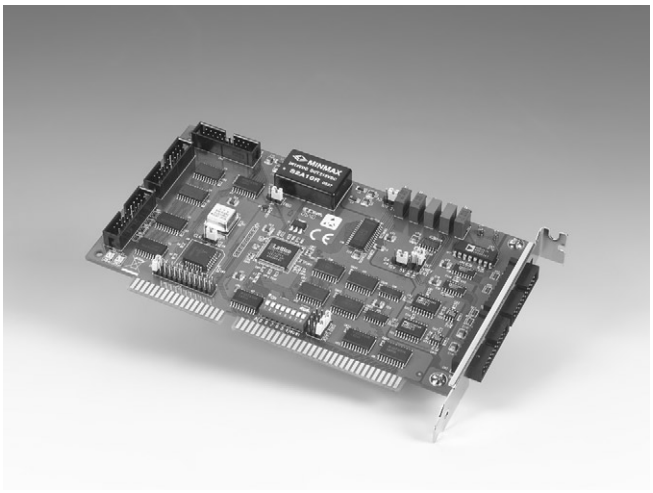
PCL-812PG

30 kS/s, 12-bit, ISA-bus Multifunction Card



Features

- 16 single-ended analog inputs
- 12-bit A/D converter, with up to 30 kHz sampling rate
- Programmable gain
- Two 12-bit analog output channels
- 16 digital inputs and 16 digital outputs
- Onboard programmable counter
- A/D with DMA or interrupt

Introduction

PCL-812PG is a multifunction analog and digital I/O card that features the five most desired measurement and control functions for PC/AT and compatible systems: A/D conversion, D/A conversion, digital input, digital output and counter/timer. This half-size card neatly packages 16 12-bit analog input channels, two 12-bit analog output channels, 16 digital input channels, 16 digital output channels and a programmable counter/timer.

In addition to all the features listed above, PCL-812PG offers the convenience of programmable analog input ranges, where the analog input range can be switched by software commands instead of DIP switches. PCL-812PG also delivers convenience and maximum resolution for applications that need different gains for different channels or different gains for different stages of a process. Comprehensive software support, numerous I/O options and a wide range of available daughterboards make the PCL-812PG ideal for industrial applications that require a combination of analog and digital I/O.

Specifications

Analog Input

- **Channels** 16 single-ended
- **Resolution** 12 bits
- **Max. Sampling Rate** 30 kS/s
- **FIFO Size** 0
- **Overvoltage Protection** ±30 V_{DC}
- **Input Impedance** >10 MΩ
- **Sampling Modes** Software, pacer or external trigger
- **Input Range** **(V, software programmable)**
  ±10, ±5, ±2.5, ±1.25, ±0.625, ±0.3125
- **Accuracy** 0.01% of reading ±1 LSB

Analog Output

- **Channels** 2 double-buffered
- **Resolution** 12 bits
- **Output Rate** Software polling
- **Output Range** **(V, software programmable)**

Internal Reference	**Unipolar**	0 ~ 5, 0 ~ 10
External Reference		±10 max.

- **Driving Capability** 10 mA max.

Digital Input

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V
  Logic 1: 2.0 V

Digital Output

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.5 V max., Logic 1: 2.4 V min.
- **Output Capacity** Sink: 8.0 mA, Source: 0.4 mA

Counter/Timer

- **Channels** 1
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 500 kHz
- **Reference Clock** Internal: 2 MHz
  External Frequency: 10 MHz
  External Voltage Range: 5V/TTL

General

- **Bus Type** ISA
- **I/O Connectors** Box header 20P x 2
- **Dimensions (L x H)** 185 x 100 mm (7.3" x 3.9")
- **Power Consumption** +5 V @ 500 mA typical, 1.0 A max.
  +12 V @ 50 mA typical, 100 mA max.
- **Operating Temperature** 0 ~ 50° C (32 ~ 122° F)
- **Storing Temperature** -20 ~ 65° C (-4 ~ 149° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCL-812PG** 30 kS/s, 12-bit, multifunction card
- **PCL-10120-1** 20-pin flat cable, 1 m
- **PCL-10120-2** 20-pin flat cable, 2 m
- **PCLD-780** Screw terminal board

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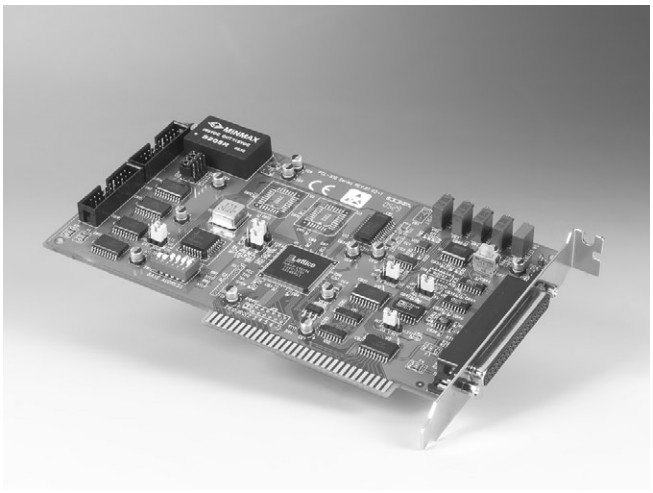
PCL-818HD/HG
PCL-818L

100 kS/s, 12-bit ISA Multifunction Card

40 kS/s, 12-bit ISA Multifunction Card



Features

- 16 single-ended or 8 differential analog inputs
- 12-bit A/D converter, with up to 100 kHz sampling rate
- Programmable gain
- Automatic channel/gain scanning
- Onboard FIFO memory (1024 samples, PCL-818HD/HG only)
- One 12-bit analog output channel
- 16 digital inputs and 16 digital outputs
- Onboard programmable counter

Introduction

The PCL-818L series was designed for entry-level models to the PCL-818 series. The cards have been designed with the cost-sensitive customer in mind, but still offers the same functions as the rest of the series, except that they have a 40 kHz sampling rate and only accepts bipolar inputs. They are fully software and connector compatible with the PCL-818HD and PCL-818HG. This lets you upgrade your applications to these higher performance cards without hardware or software changes.

The PCL-818LS bundle consists of the PCL-818L card, the PCLD-8115 wiring terminal board and a DB37 cable assembly. The PCLD-8115 accommodates onboard passive signal conditioning components (resistors and capacitors), allowing you to easily implement a low-pass filter, a voltage attenuator or a 4 ~ 20 mA voltage converter.

Specifications

Analog Input

- **Channels** 16 single-ended, or 8 differential
- **Resolution** 12 bits
- **Max. Sampling Rate** 40 kS/s for all input ranges
- **Overvoltage Protection** ±30 V_{DC} max.
- **Input Impedance** 10 MΩ
- **Sampling Modes** Software, pacer or external
- **Input Range** **(V, software programmable)**

Bipolar	±10	±5	±2.5	±1.25	±0.625
Accuracy (% of FSR ±1LSB)	0.1	0.1	0.2	0.2	0.4

Analog Output

- **Channels** 1
- **Resolution** 12 bits
- **Output Rate** Static update
- **Output Range** **(V, software programmable)**

Internal Reference	Unipolar	0 ~ 5, 0 ~ 10
External Reference		0 ~ 10, 0 ~ -10

Digital Input

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.

Digital Output

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.4 V max.
  Logic 1: 2.4 V min.
- **Output Capability** Sink: 8 mA
  Source: -0.4 mA

Timer/Counter

- **Channels** 1
- **A/D Pacer** 32-bit with 10 MHz or 1 MHz time base
- **Max. and Min. Rates** 2.5 MHz to 0.00023 Hz
- **Counter** One 16-bit counter with 100 kHz time base

General

- **Power Consumption** +5 V @ 210 mA typical, 500 mA max.
  +12 V @ 20 mA typical, 100 mA max.
  -12 V @ 20 mA typical, 40 mA max.
- **I/O Connector** DB37-F
- **Dimensions (L x H)** 155 x 100 mm (6.1" x 3.9")
- **Operating Temperature** 0 ~ 50° C (32 ~ 122° F)
- **Storage Temperature** -20 ~ 65° C (-4 ~ 149° F)
- **Operating Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

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Ordering Information

- **PCL-818L** Low-cost high-performance half-size multi-function card, user's manual and driver CD-ROM. (cable not included)
- **PCL-818LS** PCL-818L with PCLD-8115 and DB-37 cable assembly (PCL-10137-1)
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m
- **PCLD-8115** Industrial Wiring Terminal with CJC circuit and DB37 connector
- **PCLD-880** Industrial Wiring Terminal with DB37 connector

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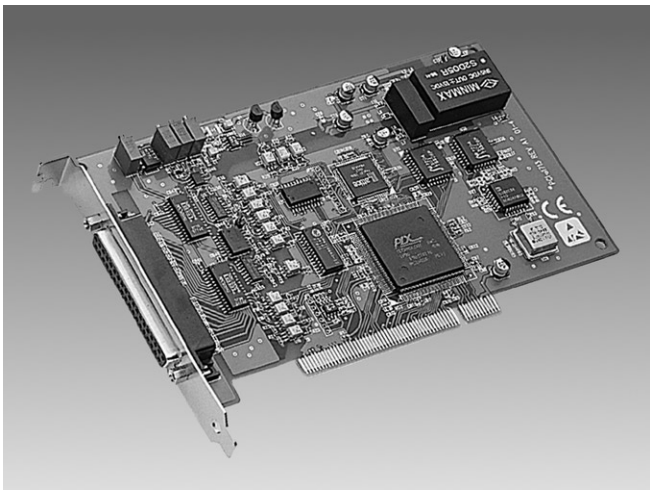
PCI-1713

100 kS/s, 12-bit, 32-ch, Isolated Analog Input Card



Features

- 32 single-ended, 16 differential or a combination of analog inputs
- 12-bit A/D converter, with up to 100 kHz sampling rate
- Programmable gain
- Onboard FIFO memory (4096 samples)
- Isolation protection (2500 V_{DC})
- S/W, internal or external pacer sampling modes supported

Introduction

The PCI-1713 is an isolated high-speed analog input card for the PCI bus. It provides 32 analog input channels with a sampling rate up to 100 kS/s, 12-bit resolution and isolation protection of 2500 V_{DC}.

Specifications

Analog Input

- **Channels** 32 single-ended/16 differential (SW programmable)
- **Resolution** 12 bits
- **Max. Sampling Rate** 100 kS/s
- **FIFO Size** 4096 samples
- **Overvoltage Protection** ±30 V
- **Isolation Protection** 2,500 V_{DC}
- **Input Impedance** 1 GΩ
- **Sampling Modes** Software, onboard programmable pacer or external (TTL level)
- **Input Range** **(V, software programmable)**

Unipolar	-	0 ~10	0 ~ 5	0 ~ 2.5	0~1.25
Bipolar	±10	±5	±2.5	±1.25	±0.625
Accuracy (% of FSR ±1LSB)	0.01	0.01	0.02	0.02	0.04

General

- **Bus Type** PCI V2.2
- **I/O Connector** 37-pin D-type female
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 850 mA
Max: +5 V @ 1.0 A
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH non-condensing (refer to IEC 68-2-3)

Programmasle Pa

- **Timer** 32-bit programmable timer
- **Timer Base** 10 MHz

Ordering Information

- **PCI-1713** 100 kS/s, 12-bit, 32-channel Isolated Analog Input Card, user's manual and driver CD-ROM. (cable not included)
- **PCLD-881B** Industrial Wiring Terminal Board (cable not included)
- **ADAM-3937** Wiring Terminal Board
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m

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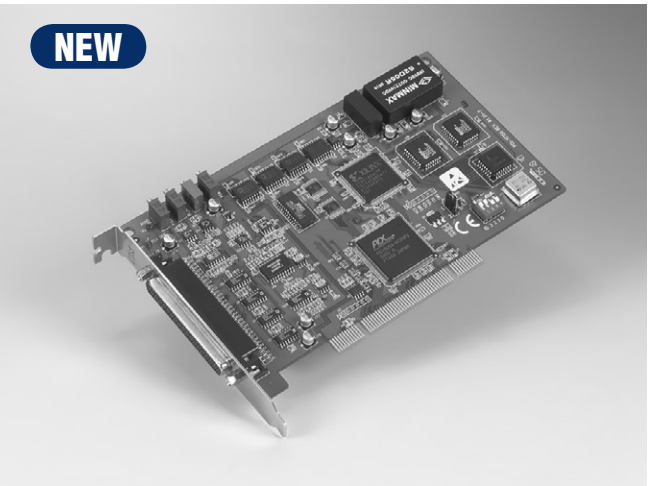
PCI-1715U

500 kS/s, 12-bit, 32-channel Isolated Analog Input Card



Features

- 2500 V_{DC} isolation protection
- 32 single-ended or 16 differential analog inputs, or a combination
- 12-bit resolution for A/D conversion
- Up to 500 kS/s sampling rate for A/D conversion
- Programmable gain for each input channel
- Onboard 1024 samples FIFO buffer
- S/W, internal or external pacer sampling modes supported
- Universal PCI Bus
- BoardID™ switch

Introduction

The PCI-1715U is an isolated high-speed analog input card for the PCI bus. It provides 32 analog input channels with a sampling rate up to 500 kS/s, 12-bit resolution and isolation protection of 2500 V_{DC}.

Specifications

Analog Input

- **Channels** 32 single-ended /16 differential (SW programmable)
- **Resolution** 12 bits
- **Max. Sampling Rate** 500 kS/s
- **FIFO Size** 1024 samples
- **Overvoltage Protection** +/- 30 Vp-p
- **Isolation Protection** 2,500 V_{DC}
- **Input Impedance** 1 GΩ
- **Sampling Modes** Software, onboard programmable pacer or external (TTL level)
- **Input Range** **(V, software programmable)**

Unipolar	-	0 ~10	0 ~ 5	0 ~ 2.5	0 ~ 1.25
Bipolar	±10	±5	±2.5	±1.25	±0.625
Accuracy (% of FSR ±1LSB)	0.01	0.01	0.02	0.02	0.04

General

- **Bus Type** Universal PCI V2.2
- **I/O Connector** 37-pin D-type female
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 850 mA
  Max: +5 V @ 1.0 A
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCI-1715U** 500 kS/s 12-bit, 32-channel Isolated Analog Input Card, user's manual and driver CD-ROM. (cable not included)
- **PCLD-881B** Industrial Wiring Terminal Board (cable not included)
- **ADAM-3937** Wiring Terminal Board
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m

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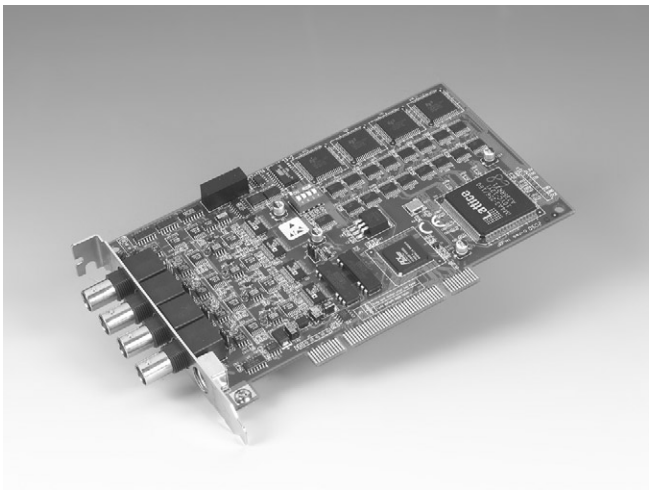
PCI-1714
PCI-1714UL

30 MS/s Simultaneous 4-ch Analog Input Card

10 MS/s Simultaneous 4-ch Analog Input Card



Features

- 4 single-ended analog input channels
- 12-bit A/D converter, with up to 30 MHz sampling rate
- Programmable gain
- Onboard FIFO memory
  (PCI-1714: 32,768 samples PCI-1714UL: 8,192 samples, each channel)
- 4 A/D converters simultaneously sampling
- Multiple A/D triggering modes
- Programmable pacer/counter
- BoardID™ switch

Introduction

PCI-1714 is an advanced high-performance data acquisition card based on the PCI bus. With a large FIFO of 32 K for each channel, the maximum sampling rate of PCI-1714 can get up to 30 MS/s, on each channel, with an emphasis on continuous, non-stop, high-speed, streaming data of samples to host memory. The low-cost PCI-1714UL offers 10MS/s on each channel at a stable rate, and has also been equipped with a universal PCI interface.

Specifications

Analog Input

- **Channels** 4 single-ended
- **Resolution** 12 bits
- **Max. Sampling Rate** 30 MS/s for PCI-1714
  (Under 32,768 samples for ea. ch)
  10 MS/s for PCI-1714UL
  (Under 8,192 samples for ea. ch)
- **FIFO Size** PCI-1714: 32,768 samples for each channel
  PCI-1714UL: 8,192 samples for each channel
- **Overvoltage Protection** 30 Vp-p
- **Input Impedance** 50 Ω/1 MΩ/Hi Z jumper selectable/100 pF
- **Sampling Modes** Software polling, pacer
- **Trigger Modes** Post-trigger, pre-trigger, delay-trigger, about-trigger
- **Input Range** **(V, software programmable)**

Bipolar	±5V	±2.5V	±1V	±0.5V

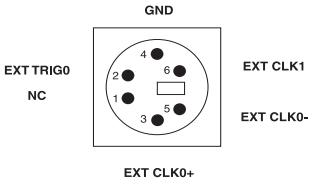
General

- **Bus Type** PCI-1714: PCI V2.2
  PCI-1714UL: Universal PCI V2.2
- **I/O Connectors** 4 x BNC connector (for AI)
  1 x PS/2 connector (for Ext. clock and trigger)
- **Dimensions** 175 x 100mm (6.9" x 3.9")
- **Power Consumption** Typical +5 V @ 850 mA ; +12 V @ 600 mA
  Max.: +5 V @ 1 A ; +12 V @ 700m A
- **Operating Temperature** 0 ~ 70° C (32 ~ 158° F)
- **Storage Temperature** -20 ~ 85° C (-4 ~ 185° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)
- **Certifications** CE

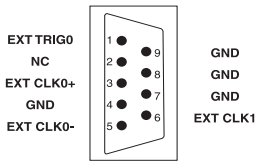
Ordering Information

- **PCI-1714** 30 MHz Simultaneous 4-ch Analog Input card
- **PCI-1714UL** 10 MHz Simultaneous 4-ch Analog Input card
- **ADAM-3909** DB-9 Wiring Terminal for DIN-rail Mounting
- **PCL-10901-1** PS2 to DB9 Wiring Cable, 1 m
- **PCL-10901-3** PS2 to DB9 Wiring Cable, 3 m
- **PCL-1010B-1** BNC to BNC Wiring Cable, 1 m

Pin Assignments



Onboard PS/2 connector



PS/2 To DB-9 Cable Connector

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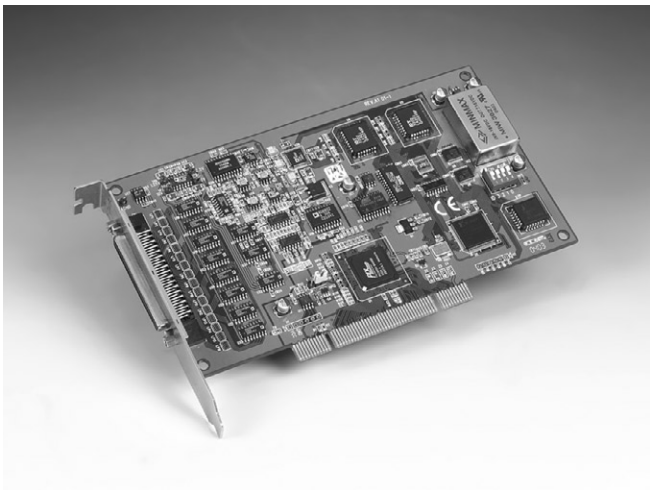
PCI-1747U

250 kS/s, 16-bit, 64-ch Analog Input Card



Features

- 64 single-ended, 32 differential or a combination of analog inputs
- 16-bit A/D converter, with up to 250 kHz sampling rate
- Auto calibration
- Onboard FIFO memory (1024 samples)
- PCI-Bus mastering data transfer
- Universal PCI Bus (support 3.3 V or 5 V PCI bus signal)
- BoardID™ switch

Introduction

PCI-1747U is a high-resolution, high-channel-count analog input card for the PCI bus. Its sampling rate is up to 250 kS/s and 16-bit resolution provides the resolution needed for most data acquisition applications. PCI-1747U provides 64 single-ended, 32 differential analog input channels or a combination of these. It also has built in a 1 K FIFO buffer for analog input data.

Specifications

Analog Input

- **Channels** 64 single-ended, 32 differential, or combination
- **Resolution** 16 bits
- **Max. Sampling Rate** 250 kS/s
- **FIFO Size** 1024 samples
- **Overvoltage Protection** 30 Vp-p
- **Input Impedance** 100 MΩ/10 pF(Off); 100 MΩ/100 pF(On)
- **Sampling Modes** Software, onboard programmable pacer or external
- **Input Range** **(V, software programmable)**

Unipolar	-	0~10	0~5	0~2.5	0~1.25
Bipolar	±10	±5	±2.5	±1.25	±0.625
Accuracy (% of FSR ±1LSB)	0.03	0.02	0.02	0.03	0.04

General

- **Bus Type** Universal PCI V2.2
- **I/O Connector** 68-pin SCSI-II female
- **Dimensions** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 850 mA, +12 V @ 600 mA
Max: +5 V @ 1 A, +12 V @ 700 m A
- **Operating Temperature** 0 ~ 60 °C (32 ~ 158 °F) (refer to IEC 68-2-1,2)
- **Storing Temperature** -20 ~ 70°C (-4 ~ 185°F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)
- **Certifications** CE

Ordering Information

- **PCI-1747U** 250 kS/s, 16-bit, 64-ch, analog input universal PCI bus card
- **ADAM-3968** SCSI-68 wiring terminal, DIN-rail mount
- **PCL-10168-1** SCSI-68 shielded cable, 1 m
- **PCL-10168-2** SCSI-68 shielded cable, 2 m

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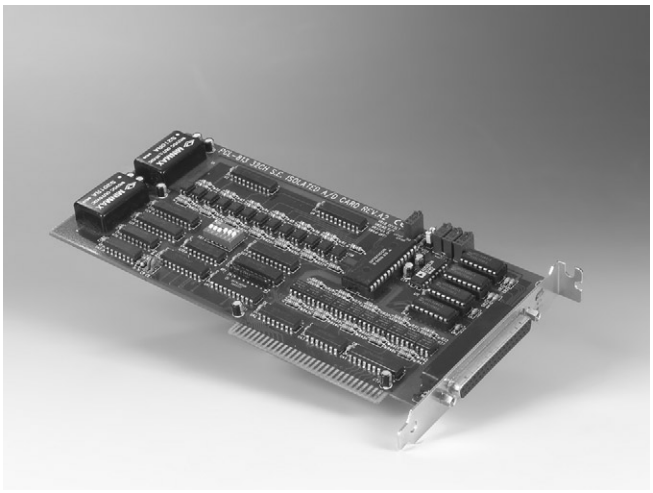
PCL-813B

32-ch S.E. Isolated Analog Input Card



Features

- 32 single-ended analog input channels
- 12-bit A/D converter, with up to 100 kHz sampling rate
- Isolation protection (500 V_{DC})
- Program-controlled A/D trigger and data transfer

Introduction

PCL-813B is a 12-bit 32-channel analog input card that offers high-voltage isolation on each analog input. It is an extremely cost effective solution for applications in industrial measurement and monitoring. The card offers 32 analog input channels with software programmable gain on each channel and two DC-to-DC converters on a 4-layer PCB with an integral ground plane. Optically-isolated inputs provide over 500 V_{DC} of isolation between the analog inputs and the PC, protecting the PC and peripherals from damage due to high voltages on the input lines. PCL-813B is ideal for situations where the budget-conscious user requires flexibility, stability and a high level of isolation protection. PCL-813B comes with the PCLD-881 wiring terminal board and a DB-37 cable assembly.

Specifications

Analog Input

- **Channels** 32 single-ended
- **Resolution** 12 bits,
- **Max. Sampling Rate** 25 kHz
- **Overvoltage Protection** Continuous ±30 V (max.)
- **Isolation Protection** 500 V_{DC} from analog input to PC
- **Input Impedance** > 10 MΩ
- **Sampling Modes** software trigger
- **Input Range** **(V)**

Unipolar (jumper selection)	0 ~ 10	0 ~ 5	0 ~ 2.5	0 ~ 1.25
Bipolar (software selection)	±5	±2.5	±1.25	±0.625
Accuracy (% of FSR ±1LSB)	0.01	0.01	0.01	0.01

- **Accuracy** 0.01% of reading ±1 LSB

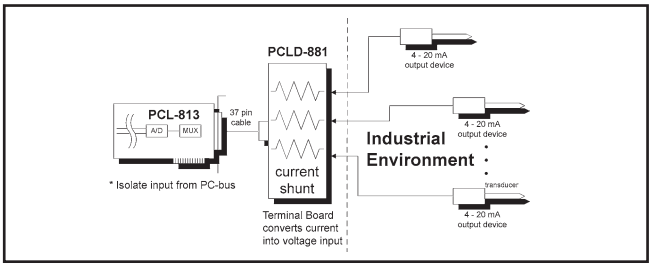
General

- **Bus Type** ISA
- **I/O Connectors** 1 x DB37-F
- **Dimensions (L x H)** 219 x 100 mm (8.6" x 3.9")
- **Power Consumption** +5 V @ 660 mA max.
  +12 V @ 140 mA max.
- **Operating Temperature** 0 ~ 50° C (32 ~ 122° F)
- **Storing Temperature** -20 ~ 65° C (-4 ~ 149° F)
- **Storing Humidity** 5 ~ 95% RH non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCL-813B** 32-ch. isolated analog input card, PCLD-881B wiring terminal board, DB-37 cable assembly, manual and driver CD-ROM.
- **PCLD-881B** Industrial terminal board for PCI-1713 & PCL-813B
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m
- **ADAM-3937** DB37 wiring terminal for DIN-rail mounting

Typical application for PCL-813B:



Industrial 4 ~ 20 mA Output Device Monitoring

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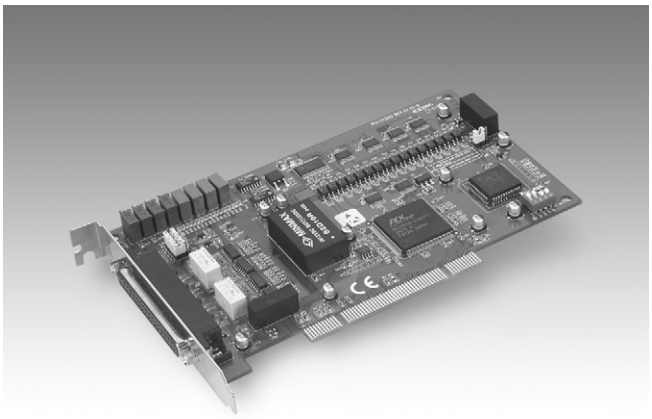
PCI-1720U

4-ch Universal Isolated Analog Output Card



Features

- 4 12-bit D/A output channels
- Multiple output ranges
- 2,500 V_{DC} isolation between the outputs and the PCI bus
- Keeps the output settings and values after system reset
- One DB37 connector for easy wiring
- Universal PCI and BoardID™ switch

Introduction

The PCI-1720U provides four 12-bit isolated digital-to-analog outputs for the Universal PCI bus. With isolation protection of 2500 V_{DC} between the outputs and the PCI bus, the PCI-1720U is ideal for industrial applications where high-voltage protection is required.

Specifications

Analog Output

- **Channels** 4 isolated channels
- **Resolution** 12 bits
- **Output Rate** Static update
- **Output Range** **(Software programmable)**

Internal Reference	**Unipolar (V)**	0 ~ 5, 0 ~ 10
	Bipolar (V)	±5, ±10
	Current Loop (mA)	0~ 20, 4 ~ 20

- **Slew Rate** 2 V/μs
- **Isolation Protection** 2,500 V_{DC} (between the outputs and the PCI bus)
- **Driving Capability** ±5 mA max.
- **Operation Modes** Software polling
- **Accuracy** ±0.024%
- **Current Loop Excitation**
- **Voltage** 50 V (max.)

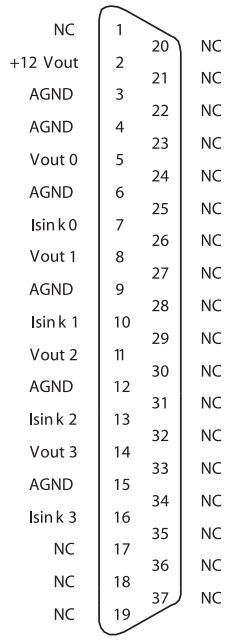
General

- **Bus Type** PCI-1720: PCI V2.2
PCI-1720U: Universal PCI 2.2
- **I/O Connectors** 1 x DB37-F
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** +5 V @ 350 mA (typical), 500 mA (max.)
+12 V @ 200 mA (typical), 350 mA (max.)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ +70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)
- **Certifications** CE

Ordering Information

- **PCI-1720U** 4-ch, 12-bit isolated Universal PCI analog output card
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m
- **ADAM-3937** DB37 Wiring terminal for DIN-rail mounting
- **PCLD-880** Screw terminal board

Pin Assignments



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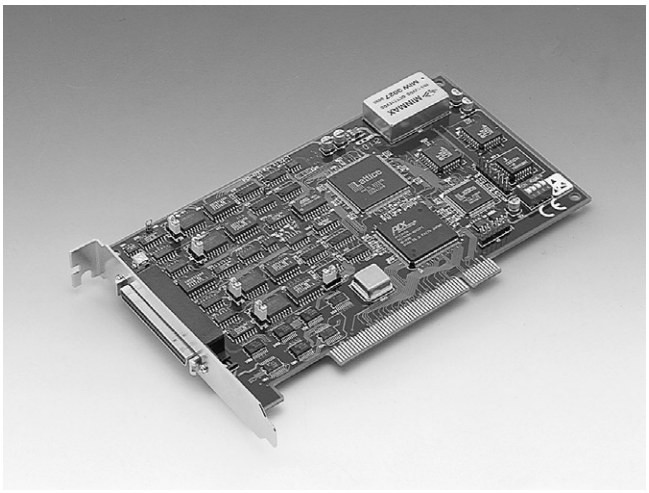
PCI-1721

12-bit, 4-ch Advanced Analog Output Card



Features

- 10 MHz maximum digital update rate
- PCI-bus mastering for data transfer
- Auto calibration function
- Four analog output channels with 1024 samples FIFO buffer
- A 12-bit DAC is equipped for each of analog output channels
- Real-time waveform output function with internal/external pacer
- Synchronized output function
- Flexible output types and range settings
- Keeps the output settings and values after system hot reset
- 16-ch DI/O and one 10 MHz 16-bit resolution counter
- BoardID™ switch

Introduction

PCI-1721 is an advanced high-speed analog output card for the PCI bus, and each of analog output channels are equipped with a 12-bit, double-buffered DAC. It features many powerful and unique functions, like a waveform output function with 10 MHz maximum update rate, auto-calibration and a BoardID switch. PCI-1721 is an ideal solution for industrial applications where high-speed continuous analog output or real-time waveform output functions are required.

Specifications

Analog Output

- **Channels** 4
- **Resolution** 12 bits
- **FIFO Size** 1024 samples
- **Output Rate** 10 MHz or static update
- **Reference Clock** Internal: 10 MHz
  External Clock Frequency: 10 MHz max.
  External Voltage Range: 0.8 V max., 2 V min.
- **Output Range** **(Software programmable)**

Internal Reference	**Unipolar**	0 ~ 5 V, 0 ~ 10 V,
	Bipolar	±5 V, ±10 V
	Current Loop	0 ~ 20 mA, 4 ~ 20 mA
External Reference		0 ~ +x V @ +x V (-10 ≤ x ≤ 10) -x ~ +x V @ +x V (-10 ≤ x ≤ 10)

- **Slew Rate** 10 V/μs
- **Driving Capability** ±10 mA
- **Output Impedance** 0.1 Ω max.
- **Operation Modes** Single/Continuous/Waveform/Synchronized output
- **Accuracy** Relative: ±1 LSB
  Differential Non-Linearity: ±1 LSB (monotonic)
- **Current Loop Excitation Voltage** +15 V (external)

Digital Input/Output

- **Channels** 16 (shared by input/output)
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.
- **Output Capability** Sink: 0.5 V @ 24 mA
  Source: 2.0 V @ -15 mA

Counter/Timer

- **Channels** 1
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 10 MHz
- **Reference Clock** Internal: 10 MHz
  External Clock Frequency: 10 MHz max.
  External Voltage Range: 0.8 V max, 2.0 V min.

General

- **Bus Type** PCI V2.2
- **I/O Connectors** 1 x 68-pin SCSI-II female
- **Dimensions** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 850 mA, +12 V @ 600 mA
  Max: +5 V @ 1 A, +12 V @ 700 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 85° C (-4 ~ 185° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)
- **Certifications** CE

Ordering Information

- **PCI-1721** 4-ch, 12-bit advanced PCI analog output card
- **PCL-10168-1** SCSI-68 shielded cable, 1 m
- **PCL-10168-2** SCSI-68 shielded cable, 2 m
- **ADAM-3968** SCSI-68 wiring terminal, DIN-rail mount

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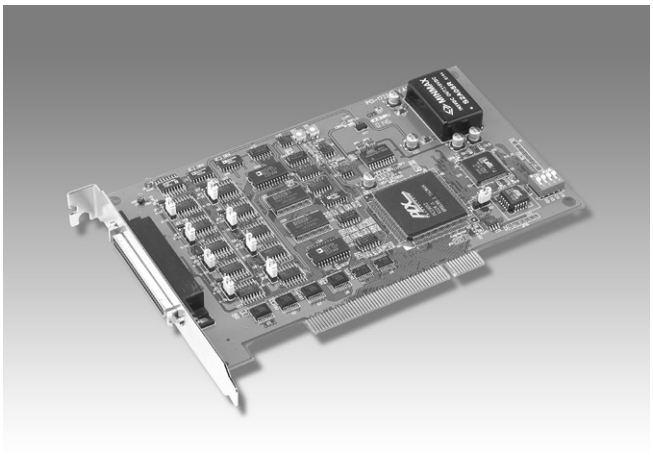
PCI-1723

16-bit, 8-ch Non-isolated Analog Output Card



Features

- Auto calibration function
- A 16-bit DAC is equipped for each analog output channel
- Synchronized output function
- Output values retained after system hot reset
- 2-port (16-channel) user-defined digital input/output
- BoardID™ switch

Introduction

PCI-1723 is a non-isolated multiple channel analog output card for the PCI bus, and each analog output channel is equipped with a 16-bit, double-buffered DAC. It also features an auto-calibration function and a BoardID™ switch. The PCI-1723 is an ideal solution for industrial applications where multiple analog output channels are required.

Specifications

Analog Output

- **Channels** 8
- **Resolution** 16 bits
- **Output Rate** Static update
- **Output Range** **(Software programmable)**

Internal Reference	**Bipolar (V)**	±10
	Current Loop (mA)	0 ~ 20, 4 ~ 20

- **Driving Capability** 5 mA
- **Output Impedance** 0.1 Ω max.
- **Operation Modes** Software polling, Synchronized output
- **Accuracy** Relative ±6 LSB
  Differential Non-linearity ±6 LSB (monotonic)

Digital Input/Output

- **Channels** 16 (shared by input/output)
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.
- **Output Capability** Sink: 0.5 V @ 24 mA
  Source: 2.0 V @ -15 mA

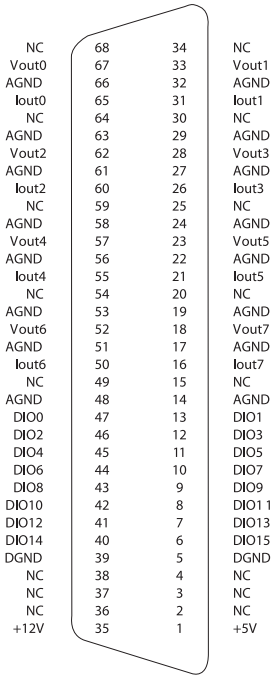
General

- **Bus Type** PCI V2.2
- **I/O Connectors** 1 x 68-pin SCSI-II female
- **Dimensions** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 850 mA, +12 V @ 600 mA
  Max.: +5 V @ 1 A, +12 V @ 700 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 158° F) (IEC 68-2-1,2)
- **Storing Temperature** -20 ~ 85° C (-4 ~ 185° F)
- **Storing Humidity** 5 ~ 95 % RH non-condensing (IEC 68-2-3)
- **Certifications** CE

Ordering Information

- **PCI-1723** 16-bit, 8-ch Non-isolated Analog Output Card
- **PCL-10168-1** SCSI-68 shielded cable, 1 m
- **PCL-10168-2** SCSI-68 shielded cable, 2 m
- **ADAM-3968** SCSI-68 wiring terminal, DIN-rail mount

Pin Assignments



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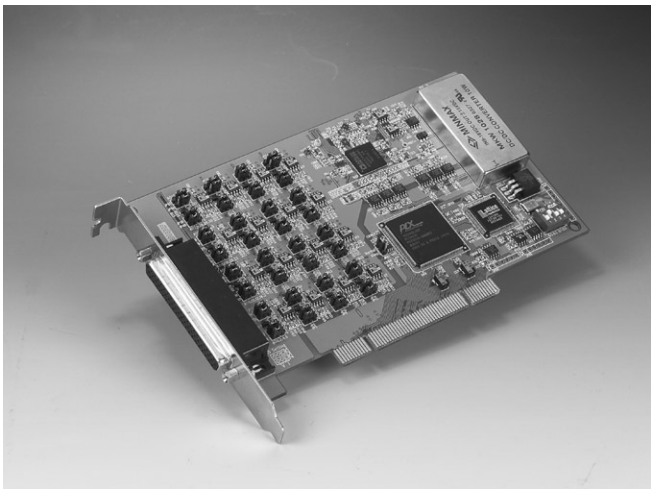
PCI-1724U

14-bit, 32-ch Isolated Analog Output Card



Features

- 32 high-density analog output channels
- Flexible Output Range: +/-10 V, 0 ~ 20 mA and 4 ~ 20 mA
- Synchronized output function
- Keeps output values after system hot reset
- BoardID™ switch

Introduction

PCI-1724U is an isolated high-density multiple channel analog output card for the PCI bus, where each analog output channel is equipped with a 14-bit DAC. It feaures optional voltages, current output and a BoardID™ switch. PCI-1724U is an ideal solution for industrial applications where multiple analog output channels are required.

Specifications

Analog Output

- **Channels** 32 isolated
- **Resolution** 14 bits
- **Output Rate** Static update
- **Output Range** **(Software programmable)**

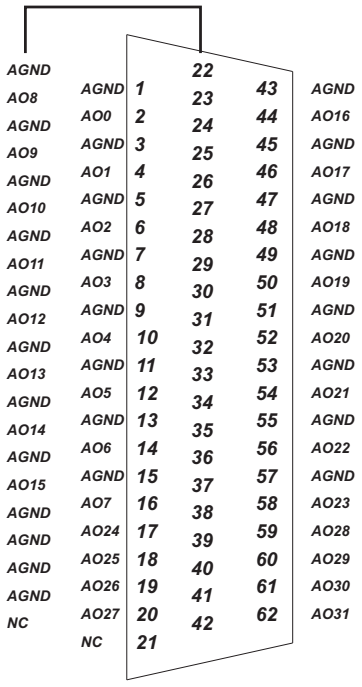
Internal Reference	**Bipolar (V)**	±10
	Current Loop (mA)	0 ~ 20, 4 ~ 20

- **Isolation Protection** 1,500 V_{DC} system isolation
- **Output Impedance** 0.1 Ω max.
- **Operation Modes** Software polling, synchronized output
- **Accuracy** Relative +/- 4 LSB
  Differential Non-linearity +/- 2 LSB (monotonic)
- **Driving Capacity** +/- 10 mA

General

- **Bus Type** Universal PCI V2.2
- **I/O Connectors** 1 x 62-pin D-type
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** +5 V @ 400 mA, +12 V @ 270 mA max.
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95 % RH, non-condensing (refer to IEC 68-2-3)

Pin Assignments



Ordering Information

- **PCI-1724U** 14-bit, 32-ch isolated analog output Card
- **PCI-10162** DB62 cable assembly (1 m, 3 m)
- **ADAM-3962** DB62 cable wiring terminal for DIN-rail mounting

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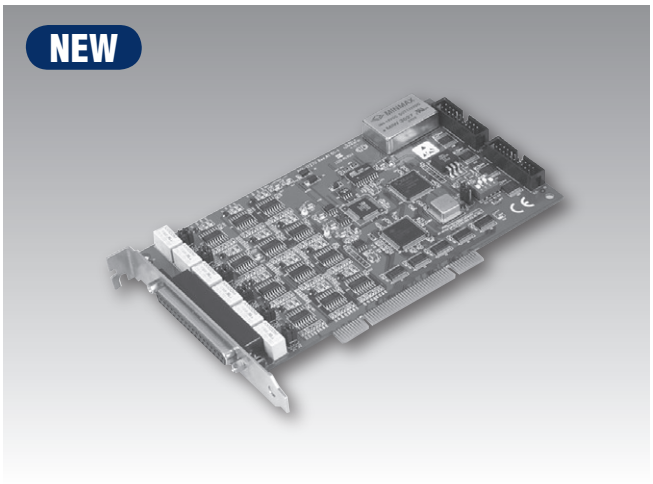
PCI-1727U

14-bit, 12-ch Analog Output PCI Card with Digital I/O



Features

- 12 independent analog output channels
- Fuse on each channel
- Universal PCI for 5 V and 3.3 V support
- BoardID™ switch
- Synchronized output function
- Supports PCL-727 compatible mode

Introduction

PCI-1727U provides twelve 14-bit analog output channels, and is pin-compatible with the ISA PCL-727 card for easy migration. It supports both +/-10V and 0 ~ 20mA current loop (sink). The card's on board DC-to-DC converter ensures the full 10V D/A output is always available.

Each analog output channel has a built-in fuse to protect the circuit, PC and the external devices. PCI-1727U is an ideal, economical solution for the applications which require multiple PID control loops.

In addition to its analog outputs, PCI-1727U provides 16 TTL DI and 16 TTL DO channels that are easily applied with industrial on/off control applications.

Specifications

Analog Output

- **Channels** PCI-1727U: 12
PCL-727: 12
- **Resolution** PCI-1727U: 14 bits
PCL-727: 12 bits
- **Output Rate** Static output
- **Output Range** **(Software programmable)**

Internal Reference	**Bipolar (V)**	±10
	Current Loop (mA)	0 ~ 20

- **Slew Rate** 0.7 V/μs
- **Driving Capability** 15 mA
- **Operation Modes** Software polling, synchronized output
- **Current Loop Excitation Voltage** 8 ~ 36 V

Digital Input

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max
Logic 1: 2.0 V min.
- **Input loading** 0.5 V @ 0.4 mA max. (low)
2.7 V @ 50 μA max (high)

Digital Output

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.5 V, Logic 1: 2.4 V
- **Output Capability** Sink: 0.8 mA @ 0.5 V
Source: 0.4 mA @ 2.4 V

General

- **Bus Type** PCI-1727U: Universal PCI V2.2
PCL-727: ISA
- **I/O Connectors** 1 x 37-pin D-type female
2 x 20-pin male ribbon cable connectors
- **Power Consumption** PCI-1727U
+5 V @ 460 mA typical,500 mA max
+12 V @ 150 mA typical,100 mA max
PCL-727
+5 V @ 500 mA typical, 1A max
+12 V @50 mA typical, 110 mA max
-12 V @ 14 mA typical, 90 mA max
- **Dimensions** PCI-1720U: 175 × 100 mm (6.9" ×3.9")
PCL-727: 340 x 100 mm (13.4" x 3.9")
- **Operating Temperature** 0 ~ 50° C (32 ~ 122° F)
- **Storing Temperature** PCI-1727U: -20 ~ 65° C (-4 ~ 149° F)
PCL-727: 0 ~ 65° C (32 ~ 149° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing

Ordering Information

- **PCI-1727U** 12-ch, 14-bit Universal PCI analog output card
- **PCL-10120-1** 20-pin flat cable, 1 m
- **PCL-10137-1** DB37 cable assembly, 1 m
- **ADAM-3937** DB37 wiring terminal for DIN-rail mounting
- **PCLD-780** Two 20-pin screw terminal board
- **PCLD-782** Opto-isolated D/I board
- **PCLD-785** Relay output board

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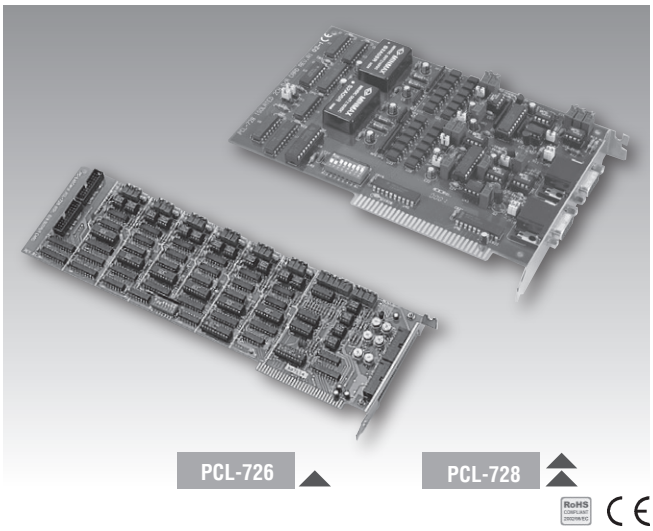
PCL-726
PCL-728

6-ch Analog Output Card with Digital I/O

2-ch Isolated Analog Output Card



Features

- Independent analog output channels
- 12-bit resolution double-buffered D/A converter
- Multiple voltage ranges: ±10 V, ±5 V, 0 ~ +5 V, 0 ~ +10 V and 4 ~ 20 mA current loop (sink)
- 16 digital input and 16 digital output channels (PCL-726)
- Two DB9 connectors for easy wiring (PCL-728)

Introduction

PCL-726, and PCL-728 are analog output cards with 12-bit analog output channels. You can individually configure each channel to any of the following ranges: 0 to +5 V, 0 to +10 V, ±5 V, ±10 V and 4 to 20 mA current loop (sink). Designed for use in industrial environments, these cards are ideal, economical solutions for applications that require multiple analog outputs or current loops.

Specifications

Analog Output

- **Channels** 6
- **Resolution** 12 bits, double buffered
- **Output Rate** Static update
- **Reference Clock** Internal:
  External Clock Frequency:
  External Voltage Range:
- **Output Range** (Software programmable)

Internal Reference	**Bipolar (V)**	+/-5, +/-10
	Unipolar (V)	0 ~ 5, 0 ~ 10
	Current Loop (mA)	4 ~ 20

- **Slew Rate** 0.3 V/μs
- **Driving Capability** ±5 mA max.
- **Output Impedance** 0.1 Ω
- **Operation Modes** Software polling
- **Accuracy** Relative: ±0.012% full scale range
  Differential Linearity: ±½ bit
- **Current Loop Excitation Voltage** Minimum +8 V, maximum +36 V for 4 ~ 20 Voltage mA current loop

Digital Input (PCL-726)

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.

Digital Output (PCL-726)

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.5 V, Logic 1: 2.4 V
- **Output Capability** Sink: 0.5 V @ 0.4 mA max.
  Source: 2.7 V @ 50 mA max.

General

- **Bus Type** ISA
- **I/O Connectors** 4 x 20-pin male ribbon cable connectors
  PCL-728: 2 x DB9 connectors
- **Dimensions (L x H)** PCL-726: 340 x 100 mm (13.4" x 3.9")
  PCL-728: 184 x 119 mm (7.25" x 4.7")
- **Power Consumption**
  PCI-726: +5 V @ 500 mA typical, 1 A max.
  +12 V @ 80 mA typical, 110 mA max.
  -12 V @ 60 mA typical, 90 mA max.
  PCL-728: +5V @ 800 mA max.
- **Operating Temperature** 0 ~ 50° C (32 ~ 122° F)
- **Storing Temperature** 0 ~ 65° C (32 ~ 149° F)
- **Operating Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCL-726** 6-ch analog output card with digital I/O, user manual and driver CD-ROM (cable not included)
- **PCL-728** Isolated 2-ch analog output card, user manual and driver CD-ROM (cable not included)
- **PCL-10120-1** 20-pin flat cable, 1 m
- **PCL-10120-2** 20-pin flat cable, 2 m
- **PCLD-780** Screw terminal board
- **PCLD-782** Opto-Isolated D/I board (16-ch)
- **PCLD-785** Relay output board (16-ch)
- **PCLD-880** Universal screw terminal board
- **ADAM-3909** DB9 wiring terminal for DIN-rail mounting
- **ADAM-3920** 20-pin wiring terminal for DIN-rail mounting

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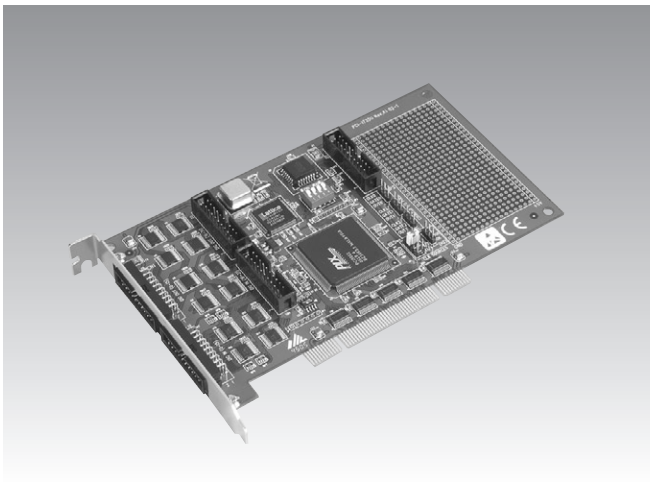
PCI-1735U

64-ch Digital I/O and Counter PCI Card



Features

- 32 TTL-level digital input channels
- 32 TTL-level digital output channels
- High-output driving capacity
- Low-input loading
- 3 programmable counter/timer channels
- User configurable clock source
- Breadboard area for custom circuits

Introduction

The PCL-720+ and PCI-1735U digital I/O and counter cards are PC-compatible add-on cards with 32 digital input channels, 32 digital output channels and three programmable counter/timer channels. Their digital I/O channels are TTL-compatible and use 74LS244 driver/buffer circuits to provide high output driving capacity. These buffered circuits also require lower input loading current than regular TTL circuits. The cards' 8254 programmable counter/timer provides three flexible 16-bit counter/timer channels. You can generate waves and pulses by programming the 8254. Jumper settings determine the clock crystal frequency. The cards also includes a breadboard area perfect for customized circuits.

Specifications

Digital Input

- **Channels** 32
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.

Digital Output

- **Channels** 32
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.5 V max.
  Logic 1: 2.0 V min.
- **Output Capability** Sink: 0.5 V max @ 24 mA
  Source: 2.0 V min. @ 15 mA

Counter/Timer

- **Channels** 3
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 1 MHz
- **Reference Clock**
  Internal: Selectable 1 MHz, 100 kHz, or 10 kHz base clock
  External Clock Frequency: Jumper selectable divider: x2, x1, x0.5, and x0.25
- **Programmable Counter Modes** 6

General

- **Breadboard Area** 540 (30 x 18) plated-through "donuts", each with a .036" hole on 0.10" centers. Further, provide +5 V on the left side, and provide GND on the right side
- **Bus Type** PCI-1735U: Universal PCI V2.2
  PCL-720+: ISA
- **I/O Connectors** 5 x 20-pin male ribbon-cable connectors
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Max: +5 V @ 98.8 mA
- **Operating Temperature** 0 ~ 65° C (32 ~ 149° F)
- **Storing Temperature** -25 ~ 80° C (-13 ~ 176° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCI-1735U** 64-ch TTL Digital I/O Card w/Counter
- **PCL-10120-1** IDC-20 Flat Cable, 1 m
- **PCL-10120-2** IDC-20 Flat Cable, 2 m
- **PCLD-780** 2*IDC-20 Wiring Terminal
- **PCLD-782** Opto-Isolated D/I Board
- **PCLD-785** 16-ch Relay Output Terminal
- **PCLD-786** SSR and Relay Driver Board
- **PCLD-885** 16-ch Power Relay Output Terminal
- **ADAM-3920** 20-Pin Flat Cable Terminal, DIN-rail Mount

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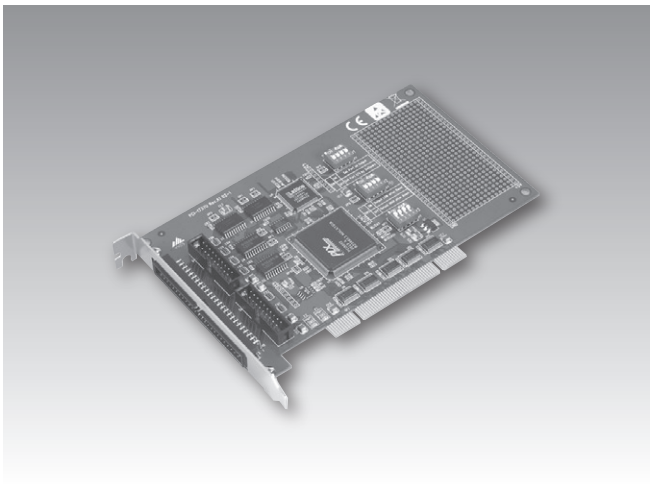
PCI-1737U

24-ch Digital I/O Card



Features

- 24 TTL digital I/O channels
- Emulates mode 0 of 8255 PPI
- Interrupt handling
- Opto-22 compatible 50-pin connectors
- Output status readback
- PCI universal card

Specifications

Digital Input

- **Channels** 24 (shared with output)
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.
- **Interrupt Capable Ch.** 1

Digital Output

- **Channels** 24 (shared with input)
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.4 V max.
  Logic 1: 2.4 V min.
- **Output Capability** Sink: 0.4 V max. @ 24 mA
  Source: 2.4 V min. @ 15 mA

General

- **Bus Type** PCI-1737: Universal PCI V2.2
  PCL-724: ISA
- **I/O Connectors** 50-pin male ribbon-cable connector
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Max: +5 V @ 294.9 mA
- **Operating Temperature** 0 ~ 65° C (32 ~ 149° F)
- **Storing Temperature** -25 ~ 80° C (-13 ~ 176° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCI-1737U** 24-ch TTL Digital I/O Card
- **PCL-10150-1.2** IDC-50 Flat Cable, 1.2 m
- **PCLD-782B** 16/24-ch Opto-isolated DI Board
- **PCLD-785B** 24/16-ch. relay output board
- **PCLD-7216** 16-ch SSR Carrier Module Board
- **PCLD-885** 16-ch Power Relay Output Terminal
- **ADAM-3950** 50-Pin Flat Cable Terminal, DIN-rail Mount

Pin Assignments

PC 7	1	2	GND
PC 6	3	4	GND
PC 5	5	6	GND
PC 4	7	8	GND
PC 3	9	10	GND
PC 2	11	12	GND
PC 1	13	14	GND
PC 0	15	16	GND
PB 7	17	18	GND
PB 6	19	20	GND
PB 5	21	22	GND
PB 4	23	24	GND
PB 3	25	26	GND
PB 2	27	28	GND
PB 1	29	30	GND
PB 0	31	32	GND
PA 7	33	34	GND
PA 6	35	36	GND
PA 5	37	38	GND
PA 4	39	40	GND
PA 3	41	42	GND
PA 2	43	44	GND
PA 1	45	46	GND
PA 0	47	48	GND
+5 V	49	50	GND

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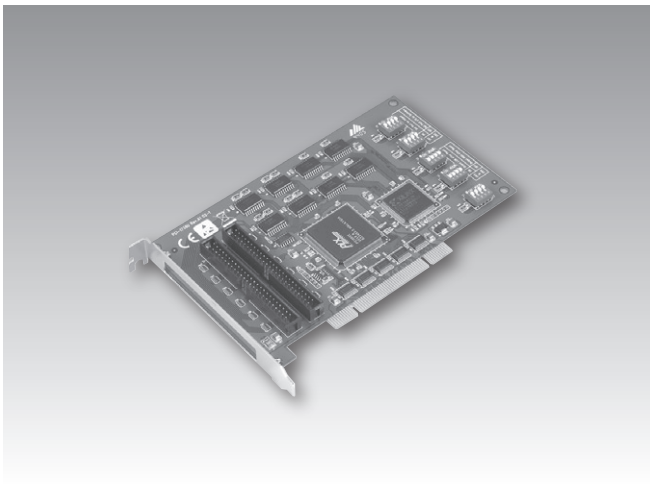
PCI-1739U

48-ch Digital I/O PCI Card



Features

- 48 TTL digital I/O channels
- Emulates mode 0 of 8255 PPI
- Interrupt handling
- Opto-22 compatible 50-pin connectors
- Output status readback
- PCI universal card

Specifications

Digital Input

- **Channels** 48 (shared with output)
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.
- **Interrupt Capable Ch.** 2

Digital Output

- **Channels** 48 (shared with input)
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.4 V max.
  Logic 1: 2.4 V min.
- **Output Capability** Sink: 0.4 V max. @ 24 mA
  Source: 2.4 V min. @ 15 mA

General

- **Bus Type** PCI V2.2
- **I/O Connectors** 2 x 50-pin male ribbon-cable connectors
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Max: +5 V @ 540.8 mA
- **Operating Temperature** 0 ~ 65° C (32 ~ 149° F)
- **Storing Temperature** -25 ~ 80° C (-13 ~ 176° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCI-1739U** 48-ch TTL Digital I/O Card
- **PCL-10150-1.2** IDC-50 Flat Cable, 1.2 m
- **PCLD-782B** 16/24-ch Opto-isolated DI Board
- **PCLD-785B** 16/24-ch Relay Output Terminal
- **PCLD-7216** 16/24-ch Relay Output Terminal
- **PCLD-885** 16-ch Power Relay Output Terminal
- **ADAM-3950** 50-Pin Flat Cable Terminal, DIN-rail Mount

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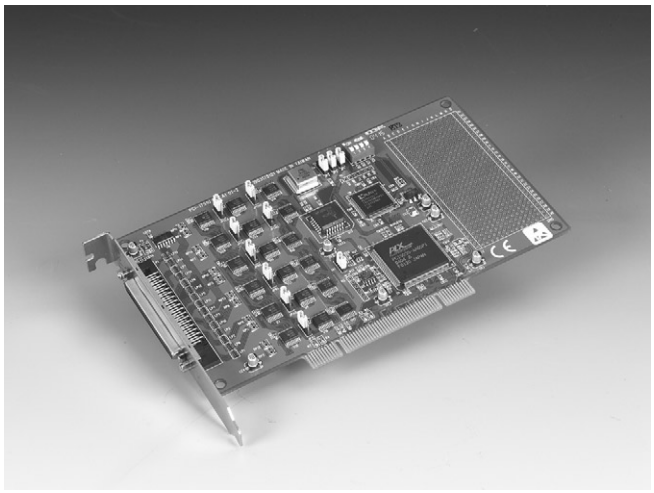
PCI-1751

48-bit Digital I/O and Counter Card



Features

- 48 TTL digital I/O lines
- Emulates mode 0 of 8255 PPI
- Buffered circuits for higher driving capacity than 8255
- Interrupt handling
- Timer/Counter interrupt capability
- Supports both dry and wet contact
- Keeps the I/O port setting and DO state after system reset
- Universal PCI & BoardID switch

Introduction

PCI-1751U is a 48-bit digital I/O card for the PCI bus. Its 48 bits are divided into six 8-bit I/O ports and users can configure each port as input or output via software. PCI-1751 also provides one event counter and two 16-bit timers, which can be cascaded to become a 32-bit timer. PCI-1751 adds a universal PCI interface for 3.3 V compatibility.

Specifications

Digital Input

- **Channels** 48 (shared with output)
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
Logic 1: 2 V min.
- **Interrupt Capable Ch.** 2

Digital Output

- **Channels** 48 (shared with input)
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.4 V max.
Logic 1: 2.4 V min.
- **Output Capability** Sink: 0.4 V @ 24 mA
Source: 2.4 V @ 15 mA

Counter/Timer

- **Channels** 3
- **Resolution** 2 x 16-bit counters, or 1 x 32-bit counter (Jumper selectable)
1 x 16-bit event counter
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 10 MHz
- **Reference Clock** Internal: 10 MHz
External Clock Frequency: 10 MHz
External Voltage Range: 5 V/TTL

General

- **Bus Type** Universal PCI V2.2
- **I/O Connectors** 68-pin SCSI-II female connector (Centronics type)
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 850 mA
Max: 5 V @ 1.0 A
- **Operating Temperature** 0 ~ 70° C (32 ~ 158° F)
- **Storing Temperature** -20 ~ 80° C (-4 ~ 176° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCI-1751** 48-bit universal digital I/O card and Counter Card,
- **PCL-10168** 68-pin SCSI cable, 1 and 2 m
- **ADAM-3968** 68-pin SCSI cable wiring terminal for DIN-rail mounting
- **ADAM-3968/20** 68-pin SCSI-II to three 20-pin Wiring Terminal Module for DIN-Rail Mounting
- **ADAM-3968/50** 68-pin SCSI to 2 x 50-pin box headers converter module
- **PCLD-8751** 48-ch Isolated DI Board
- **PCLD-8761** 24-ch Replay and 24-IDI Board

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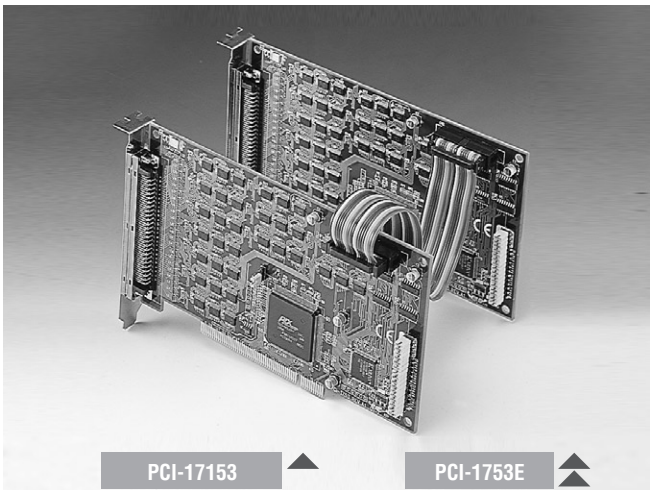
PCI-1753
PCI-1753E

96-ch Digital I/O Card

96-ch Digital I/O Extension Card for PCI-1753



Features

- Up to 192 (96 + 96) TTL digital I/O lines
- Emulates mode 0 of 8255 PPI
- Buffered circuits for higher driving capacity than 8255
- Multiple-source interrupt handling
- Interrupt output pin for simultaneously triggering external devices with the interrupt
- Output status read-back
- "Pattern match" and "Change of state" interrupt functions for critical I/O monitoring
- Keeps I/O setting and digital output values when hot system reset
- Supports dry contact and wet contact
- High-density 100-pin SCSI connector

Introduction

PCI-1753 is a 96-bit digital I/O card for the PCI bus, which can be extended to 192 digital I/O channels by connecting its extension board - PCI-1753E. The card emulates mode 0 of the 8255 PPI chip, but the buffered circuits offer a higher driving capability than the 8255. The 96 I/O lines are divided into twelve 8-bit I/O ports: A0, B0, C0, A1, B1, C1, A2, B2, C2, A3, B3 and C3. You can configure each port as input or output via software.

Specifications

Digital Input/Output

- **I/O Channels** — 96 digital I/O lines for PCI-1753
192 digital I/O lines if extending with PCI-1753E
- **Programming Mode** — 8255 PPI mode 0
- **Compatibility** — 5 V/TTL
- **Input Voltage** — Logic 0: 0.8 V max.
Logic 1: 2.0 V min.
- **Output Voltage** — Logic 0: 0.44 V max.
Logic 1: 3.76 V min.
- **Output Capability** — Sink: 0.44 V max. @ 24 mA
Source: 3.76 V min. @ 24 mA

General

- **Bus Type** — PCI V2.2
- **I/O Connector** — 1 x 100-pin SCSI female connector (Centronics™)
- **Dimensions (L x H)** — 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** — Typical: +5 V @ 400 mA
Max: +5 V @ 2.7 A
- **Operating Temperature** — 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** — -20 ~ 70° C (-4 ~ 158° F) (refer to IEC 68-2-3)
- **Storing Humidity** — 5 ~ 95% RH, non-condensing

Pin Assignments

PA00	1	51	PA20
PA01	2	52	PA21
PA02	3	53	PA22
PA03	4	54	PA23
PA04	5	55	PA24
PA05	6	56	PA25
PA06	7	57	PA26
PA07	8	58	PA27
PB00	9	59	PB20
PB01	10	60	PB21
PB02	11	61	PB22
PB03	12	62	PB23
PB04	13	63	PB24
PB05	14	64	PB25
PB06	15	65	PB26
PB07	16	66	PB27
PC00	17	67	PC20
PC01	18	68	PC21
PC02	19	69	PC22
PC03	20	70	PC23
PC04	21	71	PC24
PC05	22	72	PC25
PC06	23	73	PC26
PC07	24	74	PC27
GND	25	75	GND
PA10	26	76	PA30
PA 11	27	77	PA31
PA12	28	78	PA32
PA13	29	79	PA33
PA14	30	80	PA34
PA15	31	81	PA35
PA16	32	82	PA36
PA17	33	83	PA37
PB10	34	84	PB30
PB1 1	35	85	PB31
PB12	36	86	PB32
PB13	37	87	PB33
PB14	38	88	PB34
PB15	39	89	PB35
PB16	40	90	PB36
PB17	41	91	PB37
PC10	42	92	PC30
PC1 1	43	93	PC31
PC12	44	94	PC32
PC13	45	95	PC33
PC14	46	96	PC34
PC15	47	97	PC35
PC16	48	98	PC36
PC17	49	99	PC37
VCC	50	100	VCC

PA00 ~PA07: I/O pins of Port A0
PA10 ~PA17: I/O pins of Port A1
PA20 ~PA27: I/O pins of Port A2
PA30 ~PA37: I/O pins of Port A3
PB00 ~PB07: I/O pins of Port B0
PB10 ~PB17: I/O pins of Port B1
PB20 ~PB27: I/O pins of Port B2
PB30 ~PB37: I/O pins of Port B3
PC00 ~PC07: I/O pins of Port C0
PC10 ~PC17: I/O pins of Port C1
PC20 ~PC27: I/O pins of Port C2
PC30 ~PC37: I/O pins of Port C3
GND: Ground
VCC: +5V voltage output

Ordering Information

- **PCI-1753** — 96 ch. Digital I/O Card, user's manual and driver CD-ROM. (cable not included)
- **PCI-1753E** — Extension Board for PCI-1753
- **PCL-10268** — 100-pin to 2x68-pin SCSI cable, 1 and 2m
- **ADAM-3968** — SCSI-68 wiring terminal, DIN-rail mount
- **ADAM-3968/20** — 68-pin SCSI-II to Three 20-pin Wiring Terminal Module for DIN-Rail Mounting
- **ADAM-3968/50** — 68-pin SCSI wiring terminal for DIN-rail mounting
- **PCLD-8751** — 48-ch Isolated DI Board
- **PCLD-8761** — 24-ch Relay and 24-IDI Board

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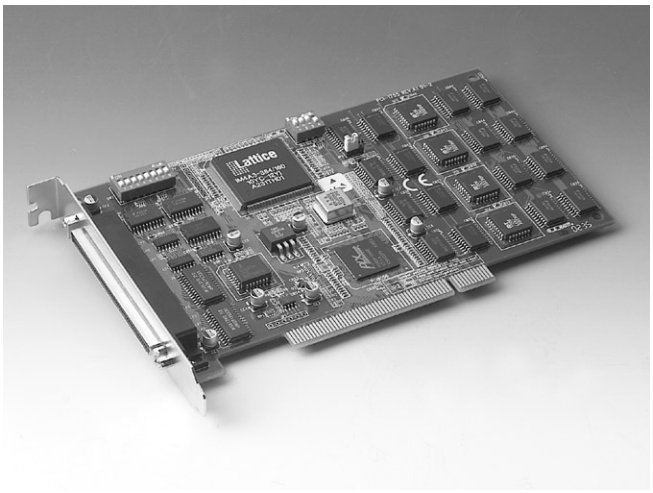
PCI-1755

Ultra-Speed 32-ch Digital I/O Card



Features

- Bus-mastering DMA data transfer with scatter gather technology
- 32/16/8-bit Pattern I/O with start and stop trigger function, 2 modes Handshaking I/O Interrupt handling capability
- Onboard active terminators for high speed and long distance transfer
- Pattern match and Change state detection interrupt function
- General-purpose 8-ch DI/O

FCC CE

Introduction

The PCI-1755 supports PCI-bus mastering DMA for high-speed data transfer. By setting aside a block of memory in the PC, the PCI-1755 performs bus-mastering data transfers without CPU intervention, setting the CPU free to perform other more urgent tasks such as data analysis and graphic manipulation. The function allows users to run all I/O unctions simultaneously at full speed without losing data.

Specifications

Channels	32 TTL compatible			
Number of Ports	Port A, Port B, Port C and Port D (8 bits/port)			
I/O Configuration	32DI (PA~PD) (default); 32DO (PA~PD); 16DI (PA~PB) & 16DO (PC~PD); 8DI (PA) & 8DO (PC) (Programmable)			
Onboard FIFO	16 KB for DI & 16 KB DO channels			
Transfer Characteristics	Data Transfer Mode	Bus Mastering DMA with Scatter-Gather		
	Data Transfer Bus Width	8/16/32 bits (programmable)		
	Max. Transfer Rate	DI: 80 M bytes/sec, 32-bit @ 20 MHz 120 M bytes/sec, 32-bit @ 40 MHz external pacer when data length is less than FIFO size DO: 80 MBytes/sec, 32-bit @ 20 MHz		
	Operation Mode	Handshaking		
Handshaking Mode	**Direction**	I/O	Samples No.	Finite transfer, Continuous I/O
	Asynchronous	8255 Emulation	Synchronous	Burst Handshaking
	Clock source for Burst Handshaking	Internal: 30 MHz, 20 MHz, 15 MHz, 12 MHz, 10 MHz, Timer#0 for DI & Timer#1 for DO External: EXT_CLKIN for DI & EXT_CLKOUT for DO		
Normal Mode	**Input**	Data Acquisition at a predetermined rate by internal/external clock		
	Output	Waveform Generation at a predetermined rate by internal/external clock		
	Clock Source for DI	Internal: 30 MHz, 20 MHz, 15 MHz, 12 MHz, 10 MHz, Timer#0 External: EXT_CLKIN		
	Clock Source for DO	Internal: 30 MHz, 20 MHz, 15 MHz, 12 MHz, 10 MHz, Timer#1 External: EXT_CLKOUT		
	Start Mode	Software command/Trigger signal occurred from DI_STR or DO_STR/Pattern DI		
	Stop Mode	Software command/Trigger signal occurred from DI_STP (for DI) or DO_STR (for DO)/Pattern DI/"Finite transfers"		
Chang Detection (DI only)	Monitor the selected input channel and capture data whenever there is a transition on one of the channels, and then issue a IRQ			
	Clock Source for DI	Internal: 30 MHz, 20 MHz, 15 MHz, 12 MHz, 10 MHz, Timer#0 External: EXT_CLKIN		
	Start Mode	Software command/Trigger signal occurred from DI_STP/Pattern DI		
	Stop Mode	Software command/Trigger signal occurred from DI_STP/PatternDI/"Finite transfers"		
Trigger Capability	**DI trigger signal**	DI_STR, DI_STP	DO trigger signal	DO_STR, DO_STP
	Low	0.8 V max.	High	2.0 V min.
	Trigger Type	Rising or falling edge, or digital pattern (for DI only)		
	Pulse width for edge triggers	10 ns min.		
	Pattern trigger detection capabilities	Detect pattern match or mismatch on user-selected data lines		
Terminator	Onboard Schottky diode termination			
Messaging	The messages can be generated when1. A specified number of bytes have been transferred, 2. When a specified input pattern is matched, 3. When a measurement operation completes.			
Input Voltage	Low	0 V min.;0.8 V max.	High	2.0 V min.;5 V max.
Input Load	Terminator OFF: TTL compatible			
	Low	+0.5 V @ ±20 mA	High	+2.7 V @ ±1 mA max.
	Terminator ON			
	Terminator Resistor	110 Ω	Termination Voltage	2.9 V
	Low	+0.5 V @ ±22.4 mA	High	+2.7 V @ ±1 mA max.
Output Voltage	Low	0.5 V max.	High	2.7 V min.
Driving Capacity	Low	0.5 V max @ +48	mA (sink)	High 2.4 V min. @ -15 mA (source)
Hysteresis	500 mV	Power Available at I/O connector	+4.65 ~ +5.25 V_{DC} @ 1A	
General-purposeDI/O	DI Channels	DI0 ~ DI7 (TTL compatible)		
	DO Channels	DO0 ~ DO7 (TTL compatible)		
Interrupt Source	DI0~7 and Timer#2, Pattern match and Change detection, DI FIFO overflow and DO FIFO underflow, DI_STP and DO_STP			

Pacer

- **Channels** Timer#0, Timer#1 and Timer#2
- **Timer#0** Timer pacer for digital input
- **Timer#1** Timer pacer for digital output
- **Timer#2** Interrupt source
- **Resolution** 16-bit
- **Base Clock** 10 MHz

General

I/O Connector Type	100-pin SCSI-II female			
Dimensions (L x H)	175 x 100 mm (6.9" x 3.9")			
Power Consumption	Typical	Terminator OFF: +5 V @ 1 A Terminator ON: +5 V @ 1 A	Max.	Terminator OFF: +5 V @ 1 A Terminator ON: +5 V @ 1 A
Temperature	Operating	0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1,2)	Storage	-20 ~ 85° C (-4 ~ 185° F)
Relative Humidity	5 ~ 95% RH non-condensing (refer to IEC 68-2-3)		Cert.	FCC, CE certified

Ordering Information

- **PCI-1755** Ultra-speed 32-ch Digital I/O Card
- **ADAM-39100** PCI-1755 Wiring Terminal for DIN-rail Mounting
- **PCL-101100-1** 100-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 1 m

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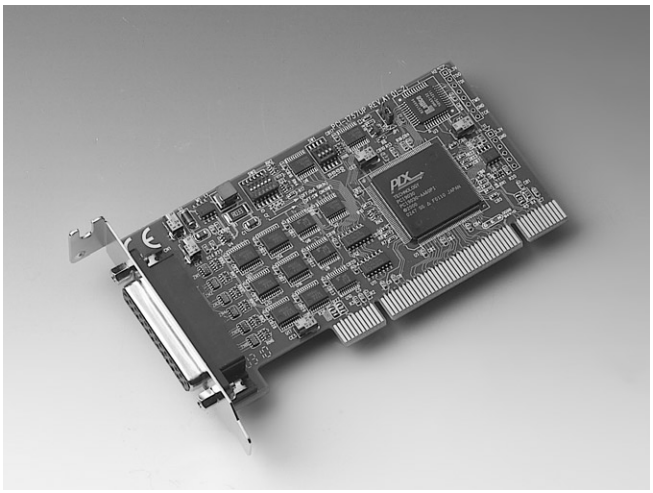
PCI-1757UP

24-ch Digital Input/Output Low Profile Universal PCI Card



Features

- Low profile PCI form factor
- Universal PCI bus
- 24 TTL level digital I/O channels
- Emulates mode 0 of 8255 PPI
- Buffered circuits provide higher driving capability
- Output status read-back
- I/O configurable by software or on board DIP switch
- Keeps port I/O settings and digital output states after hot reset
- BoardID™ switch
- Convenient DB-25 connector
- Dry/wet contact support

Introduction

PCI-1757UP is a 24-channel DI/O low profile PCI card that meets the PCI standard REV.2.2 (universal PCI expansion card). The card also works with 3.3 V and 5 V PCI slots, and provides you with 24 parallel digital input/output channels that emulate mode 0 of the 8255 PPI chip. However, the buffered circuits offer a higher driving capability than the 8255.

Specifications

Digital Input

- **Channels** 24 (shared with output)
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V @ -0.2 mA
  Logic 1: 2.0 V @ 20 mA
- **Interrupt Capable Ch.** 2

Digital Output

- **Channels** 24 (shared with input)
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.5 V max. @ -24 mA
  Logic 1: 3.7 V max. @ 24 mA
- **Output Capability** Sink: 24 mA
  Source: 15 mA

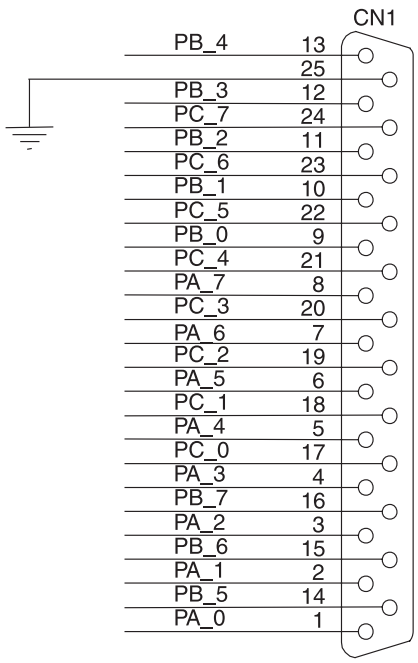
General

- **Bus Type** Universal PCI V2.2
- **I/O Connectors** 1 x DB-25 female
- **Dimensions** 119.91 x 64.41 mm (4.721" x 2.536") Low profile MD1
- **Power Consumption** Typical: 5 V @ 140 mA
  Max: 5 V @ 200 mA
- **Operating Temperature** 0 ~ 70° C (32 ~ 158° F)
- **Storing Temperature** -20 ~ 80° C(-4 ~ 176° F)
- **Storing Humidity** 5 ~ 95% non-condensing

Ordering Information

- **PCI-1757UP** 24-channel digital input/output card
- **ADAM-3925** DB25 Wiring terminal for DIN-rail mounting
- **PCL-10125-1** DB25 cable assembly, 1 m
- **PCLD-782B** 24/16-ch. opto-isolated digital input board
- **PCLD-785B** 24/16-ch. relay output board
- **PCL-12125-1** DB25 to IDC50 flat cable for PCI-1757UP, 1 m

Pin Assignments



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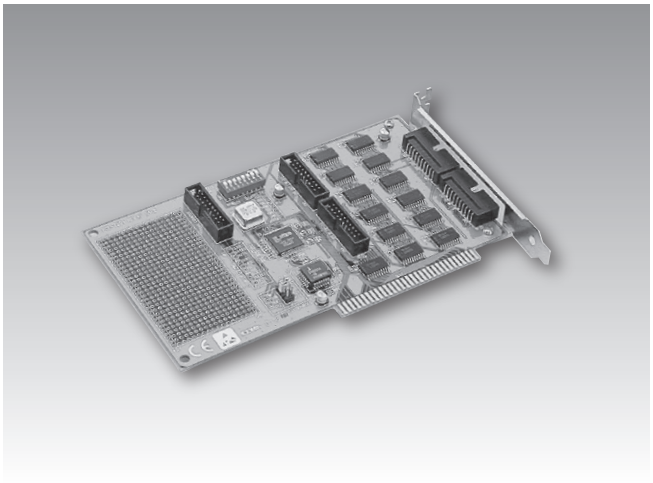
PCL-720+

64-ch TTL Digital I/O Card w/Counter



Features

- 32 TTL-level digital input channels
- 32 TTL-level digital output channels
- High-output driving capacity
- Low-input loading
- 3 programmable counter/timer channels
- User configurable clock source
- Breadboard area for custom circuits

Introduction

The PCL-720+ digital I/O and counter cards are PC-compatible add-on cards with 32 digital input channels, 32 digital output channels and three programmable counter/timer channels. Their digital I/O channels are TTL-compatible and use 74LS244 driver/ buffer circuits to provide high output driving capacity. These buffered circuits also require lower input loading current than regular TTL circuits. The cards' 8254 programmable counter/timer provides three flexible 16-bit counter/timer channels. You can generate waves and pulses by programming the 8254. Jumper settings determine the clock crystal frequency. The cards also includes a breadboard area perfect for customized circuits.

Specifications

Digital Input

- **Channels** 32
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.

Digital Output

- **Channels** 32
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.5 V max.
  Logic 1: 2.0 V min.
- **Output Capability** Sink: 0.5 V max @ 24 mA
  Source: 2.0 V min. @ 15 mA

Counter/Timer

- **Channels** 3
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 1 MHz
- **Reference Clock**
  Internal: Selectable 1 MHz, 100 kHz, or 10 kHz base clock
  External Clock Frequency: Jumper selectable divider: x2, x1, x0.5, and x0.25
- **Programmable Counter Modes** 6

General

- **Breadboard Area** 540 (30 x 18) plated-through "donuts", each with a .036" hole on 0.10" centers. Further, provide +5 V on the left side, and provide GND on the right side
- **Bus Type** PCI-1735U: Universal PCI V2.2
  PCL-720+: ISA
- **I/O Connectors** 5 x 20-pin male ribbon-cable connectors
- **Dimensions (L x H)** 185 x 100 mm (7.3" x 4")
- **Power Consumption** Typical: +5 V @ 500 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCL-720+** 64-ch TTL Digital I/O Card w/Counter
- **PCL-10120-1** IDC-20 Flat Cable, 1 m
- **PCL-10120-2** IDC-20 Flat Cable, 2 m
- **PCLD-780** 2*IDC-20 Wiring Terminal
- **PCLD-782** Opto-Isolated D/I Board
- **PCLD-785** 16-ch Relay Output Terminal
- **PCLD-786** SSR and Relay Driver Board
- **PCLD-885** 16-ch Power Relay Output Terminal
- **ADAM-3920** 20-Pin Flat Cable Terminal, DIN-rail Mount

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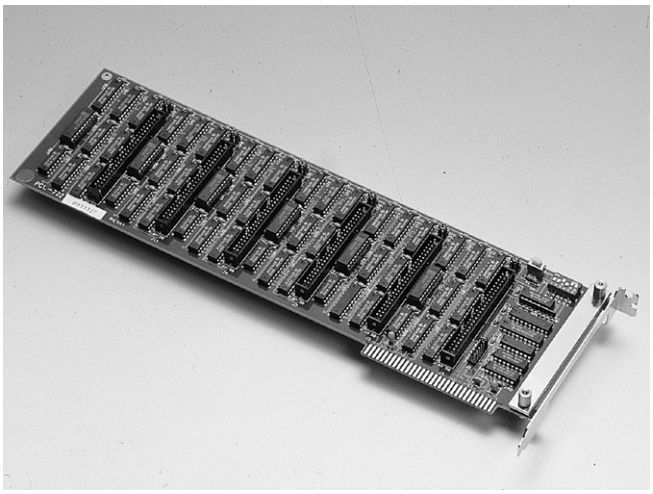
PCL-722

144-ch TTL Digital I/O ISA Card



Features

- Emulates 8255 PPI mode 0
- Buffered circuits for higher driving capacity than the 8255
- Interrupt handling
- Output status readback
- Pin compatible with Opto-22 I/O module racks

Specifications

Digital Input

- **Channels** 144 (24 channels x 6 ports) shared with output
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.
- **Interrupt Capable Ch.** Bits 0 and 3 of Port C can generate an interrupt to IRQ 2, 3, 4, 5, 6 or 7

Digital Output

- **Channels** 144 (24 channels x 6 ports) shared with input
- **Compatibility** 5 V/TTL
- **Output Voltage**
  Port A, B: Logic 0: 0.5 V max.
  Logic 1: 2.4 V min.
  Port C: Logic 0: 0.4 V max.
  Logic 1: 2.0 V min.
- **Output Capability**
  Port A, B: Sink: 12 mA
  Source: 8 mA
  Port C: Sink: 24 mA
  Source: 15 mA

General

- **Power Consumption** Typical: +5 V @ 1.3 A
  Max: +5 V @ 1.8 A
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storage Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Operating Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)
- **I/O Connectors** 6 x 50-pin male ribbon-cable connectors. Pin assignments are fully compatible with Opto-22 I/O module racks
- **Dimensions (L x H)** 334 x 100 mm (13.2" x 3.9")

Ordering Information

- **PCL-722** 144-ch TTL digital I/O ISA card
- **PCL-10150-1.2** 50-pin flat cable, 1.2 m
- **PCLD-782B** 24/16-ch. opto-isolated digital input board
- **PCLD-785B** 24/16-ch. relay output board
- **PCLD-7216** 16-ch. carrier board for SSR I/O modules
- **PCLD-885** 16-ch. power relay (Form A) output board
- **ADAM-3950** 50-pin flat cable wiring eterminal for din-rail mounting

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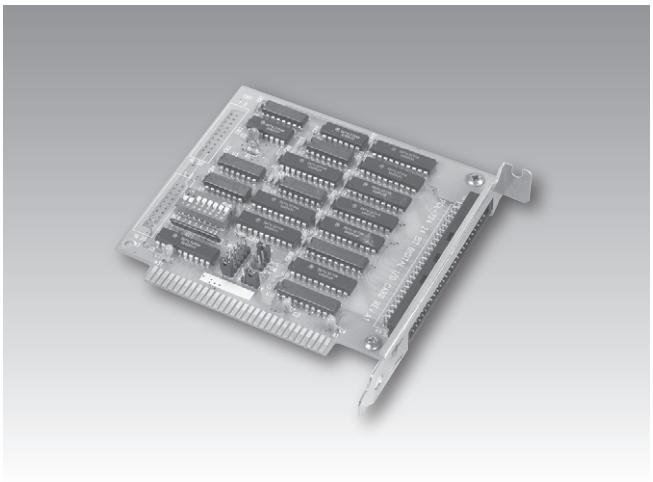
PCL-724

24-ch Digital I/O Card



Features

- 24 TTL digital I/O channels
- Emulates mode 0 of 8255 PPI
- Interrupt handling
- Opto-22 compatible 50-pin connectors
- Output status readback

Specifications

Digital Input

- **Channels** 24 (shared with output)
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.
- **Interrupt Capable Ch.** 1

Digital Output

- **Channels** 24 (shared with input)
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.4 V max.
  Logic 1: 2.4 V min.
- **Output Capability** Sink: 0.4 V max. @ 24 mA
  Source: 2.4 V min. @ 15 mA

General

- **Bus Type** ISA
- **I/O Connectors** 50-pin male ribbon-cable connector
- **Dimensions (L x H)** 125 x 100 mm (4.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 0.5 A
  Max: +5 V @ 0.8 A
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCL-724** 24-ch TTL Digital I/O Card
- **PCL-10150-1.2** IDC-50 Flat Cable, 1.2 m
- **PCLD-782B** 16/24-ch Opto-isolated DI Board
- **PCLD-785B** 24/16-ch. relay output board
- **PCLD-7216** 16-ch SSR Carrier Module Board
- **PCLD-885** 16-ch Power Relay Output Terminal
- **ADAM-3950** 50-Pin Flat Cable Terminal, DIN-rail Mount

Pin Assignments

PC 7	1	2	GND
PC 6	3	4	GND
PC 5	5	6	GND
PC 4	7	8	GND
PC 3	9	10	GND
PC 2	11	12	GND
PC 1	13	14	GND
PC 0	15	16	GND
PB 7	17	18	GND
PB 6	19	20	GND
PB 5	21	22	GND
PB 4	23	24	GND
PB 3	25	26	GND
PB 2	27	28	GND
PB 1	29	30	GND
PB 0	31	32	GND
PA 7	33	34	GND
PA 6	35	36	GND
PA 5	37	38	GND
PA 4	39	40	GND
PA 3	41	42	GND
PA 2	43	44	GND
PA 1	45	46	GND
PA 0	47	48	GND
+5 V	49	50	GND

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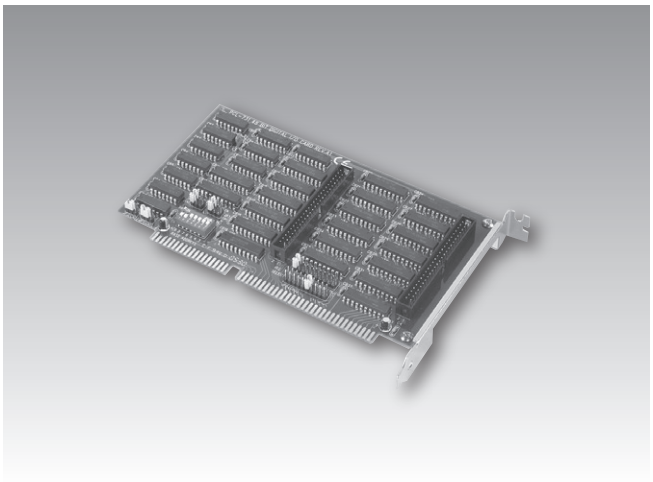
PCL-731

48-ch Digital I/O ISA Card



Features

- 48 TTL digital I/O channels
- Emulates mode 0 of 8255 PPI
- Interrupt handling
- Opto-22 compatible 50-pin connectors
- Output status readback

Specifications

Digital Input

- **Channels** 48 (shared with output)
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.
- **Interrupt Capable Ch.** 2

Digital Output

- **Channels** 48 (shared with input)
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.4 V max.
  Logic 1: 2.4 V min.
- **Output Capability** Sink: 0.4 V max. @ 24 mA
  Source: 2.4 V min. @ 15 mA

General

- **Bus Type** ISA
- **I/O Connectors** 2 x 50-pin male ribbon-cable connectors
- **Dimensions (L x H)** 185 x 100 mm (7.3" x 3.9")
- **Power Consumption** Typical: +5 V @ 0.5 A
  Max: +5 V @ 0.8 A
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCL-731** 48-ch TTL Digital I/O Card
- **PCL-10150-1.2** IDC-50 Flat Cable, 1.2 m
- **PCLD-782B** 16/24-ch Opto-isolated DI Board
- **PCLD-785B** 16/24-ch Relay Output Terminal
- **PCLD-7216** 16/24-ch Relay Output Terminal
- **PCLD-885** 16-ch Power Relay Output Terminal
- **ADAM-3950** 50-pin Flat Cable Terminal, DIN-rail Mount

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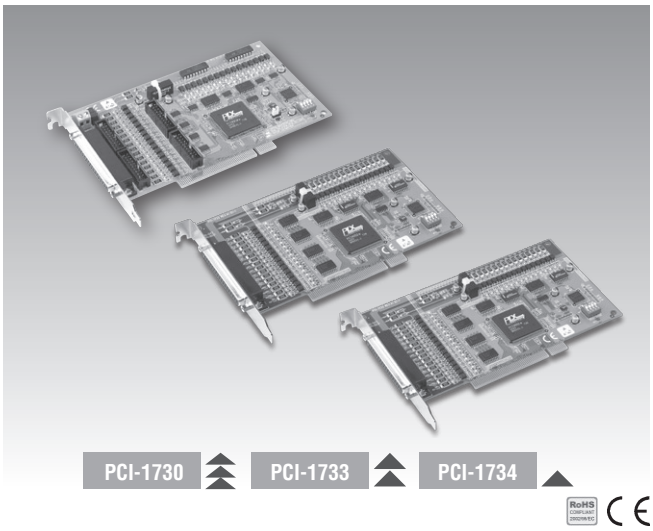
PCI-1730
PCI-1733
PCI-1734

32-ch Isolated Digital I/O PCI Card

32-ch Isolated Digital Input PCI Card

32-ch Isolated Digital Output PCI Card



Features

- 32-ch Isolated DI/O (16 inputs and 16 outputs)
- 32-ch TTL Isolated DI/O (16 inputs and 16 outputs)
- High output driving capacity
- Interrupt capability
- Two 20-pin connectors for isolated digital I/O channels and two for TTL digital I/O channels
- D-type connector for isolated input and output channels
- High-voltage isolation on output channels

Introduction

PCI-1730, PCI-1733, and PCI-1734 offer isolated digital input channels as well as isolated digital output channels with isolation protection up to 2,500 V_{DC}, which makes them ideal for industrial applications where high-voltage isolation is required. There are also 32 TTL DIO channels.

Specifications

Digital Input

- **Channels** 16 (16-ch/group)
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
Logic 1: 2.0 V min.
- **Interrupt Capable Ch.** 2 (DI0, DI1)

Isolated Digital Input

- **Channels** 16 (16-ch/group)
- **Input Voltage** Logic 0: 1 V max. (2 V max.)
Logic 1: 5V min. (30 V max.)
- **Interrupt Capable Ch.** 2 (IDI0, IDI1)
- **Isolation Protection** 2,500 V_{DC}
- **Opto-Isolator Response** 25 µs
- **Input Resistance** 2.7 kΩ @ 1 W

Digital Output

- **Channels** 16 (16-ch/group)
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.8 V max.
Logic 1: 2.0 V min.
- **Output Capability** Sink: 24 mA
Source: 15 mA

Isolated Digital Output

- **Channels** 16 (16-ch/group)
- **Output Type** Sink type (NPN)
- **Isolation Protection** 2,500 V_{DC}
- **Output Voltage** 5 ~ 40 V_{DC}
- **Sink Current** 200 mA max./channel
- **Opto-Isolator Response** 25 ms

General

- **Bus Type** PCI V2.2
- **I/O Connectors** 1 x 37-pin D-type female
2 x 20-pin box header for flat cable
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 250 mA, 12 V @ 35 mA
Max: 5 V @ 400 mA, 12 V @ 60 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -25 ~ 85° C (-13 ~ 185° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (see IEC 68-2-3)

Ordering Information

- **PCI-1730** 32-ch Isolated DIO Card, manual and driver CD-ROM (cable not. included.)
- **PCL-10120-1** 20-pin flat cable, 1 m
- **PCL-10120-2** 20-pin flat cable, 2 m
- **PCLD-782** 16-ch opto-isolated D/I board
- **ADAM-3920** 20-pin flat cable wiring terminal for DIN-rail mounting
- **PCLD-885** 16-ch power relay (form A) output board
- **PCLD-785** 16-ch relay output board
- **PCLD-786** 8-ch SSR I/O module carrier board
- **PCLD-780** Universal screw terminal board
- **PCLD-880** Universal screw terminal board
- **ADAM-3937** DB37 wiring terminal for DIN-rail mounting
- **PCL-10137-1** DB37 cable, 1 m
- **PCL-10137-2** DB37 cable, 2 m
- **PCL-10137-3** DB37 cable, 3 m

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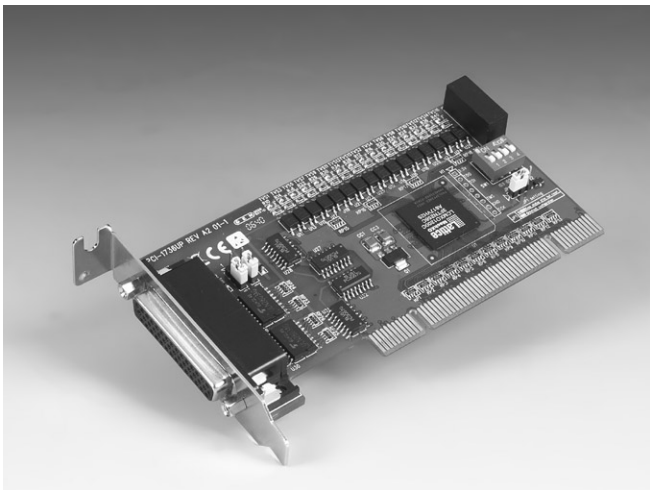
PCI-1736UP

32-ch Low-Profile Isolated Digital I/O Card



Features

- 32 isolated DI/O channels (16 inputs and 16 outputs)
- High output driving capacity
- High-voltage isolation on I/O channels (2500 V_{DC})
- Interrupt handling capability
- D-type connector for isolated input and output channels
- Keep digital output values when hot system reset
- Wide input range (5 ~ 30 V_{DC})
- Surge protection
- Universal PCI Bus
- Low profile card
- BoardID™ switch

Introduction

PCI-1736UP offer isolated digital input channels as well as isolated digital output channels with isolation protection up to 2,500 V_{DC}, which makes it ideal for industrial applications where high-voltage isolation is required. In addition, all output channels provide high-voltage protection. The low profile PCI form factor and universal PCI connector (V2.2 compliant) meet requirements for size and power consumption.

Specifications

Isolated Digital Input

- **Channels** 16
- **Input Voltage** Logic 0: 2 V max.
  Logic 1: 5 V min. (30 V max.)
- **Interrupt Capable Ch.** 2
- **Isolation Protection** 2500 V_{DC}
- **Opto-Isolator Response** 25 µs
- **Input Resistance** 2.8 KΩ

Isolated Digital Output

- **Channels** 16
- **Output Type** Sink (NPN)
- **Isolation Protection** 2500 V_{DC}
- **Output Voltage** 5-40 V_{DC}
- **Sink Current** 200 mA max./channel
- **Opto-isolator Response** 25 µs

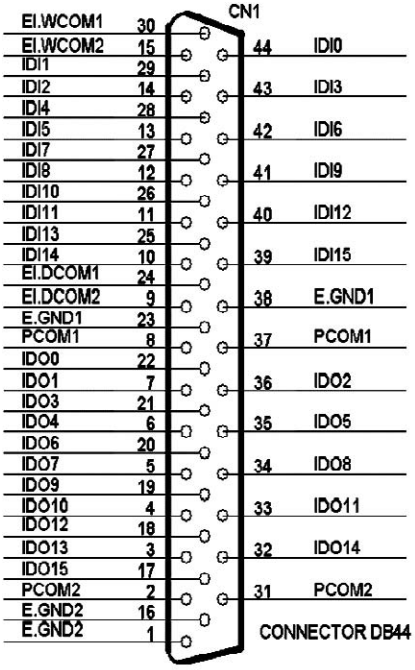
General

- **Bus Type** Universal PCI V2.2
- **I/O Connectors** DB-44 female
- **Dimensions** 119.91 x 64.41 mm (Low profile MD1)
- **Power Consumption** Typical: 5 V @ 250 mA, 12 V @ 35 mA
  Max: 5 V @ 400 mA, 12 V @ 60 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -25 ~ 85° C (-4 ~ 185° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing

Ordering Information

- **PCI-1736UP** 32-ch low-profile isolated digital I/O card
- **PCL-10144-1** DB 44-pin cable, 1 m
- **ADAM-3944** DB-44 Wiring Terminal for DIN-rail mounting

Pin Assignments



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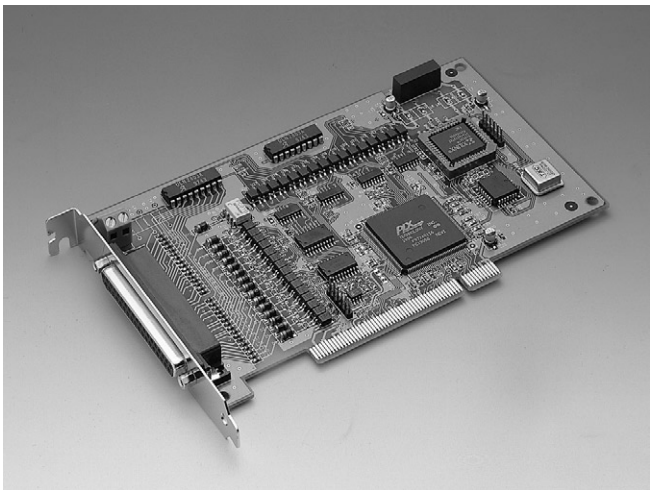
PCI-1750

32-ch Isolated Digital I/O and Counter Card



Features

- 16 isolated DI and 16 isolated DO channels
- High voltage isolation on all isolated channels (2,500 V_{DC})
- High sink current on isolated output channels (200 mA/channel)
- Supports dry contact or 5 ~ 50 V_{DC} isolated inputs
- Interrupt handling
- Timer/counter interrupt capability

Introduction

PCI-1750 offers 16 isolated digital input channels, 16 isolated digital output channels, and one isolated counter/timer for the PCI bus. With isolation protection of 2,500 V_{DC}, and dry contact support, PCI-1750 is ideal for industrial applications where high-voltage protection is required. Each I/O channel of the PCI-1750 corresponds to a bit in a PC I/O port. This makes PCI-1750 very easy to program. This card also offers a counter or timer interrupt and two digital input interrupt lines to a PC. So you can then easily do configurations by software.

Specifications

Isolated Digital Input

- **Channels** 16
- **Input Voltage** Logic 0: 2 V max.
  Logic 1: 5 V min. (50 V_{DC} max.) or dry contact
- **Interrupt Capable Ch.** 2
- **Isolation Protection** 2,500 V_{DC}
- **Opto-Isolator Response** 100 µs

Isolated Digital Output

- **Channels** 16
- **Output Type** Sink (NPN)
- **Isolation Protection** 2,500 V_{DC}
- **Output Voltage** 5 ~ 40 V_{DC}
- **Sink Current** 200 mA max. per channel
- **Opto-Isolator Response** 100 µs

Counter/Timer

- **Channels** 1
- **Resolution** 1 x 32-bit timer
  1 x 16-bit isolated counter
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 1 MHz
- **Isolation Protection** 2,500 V_{DC}

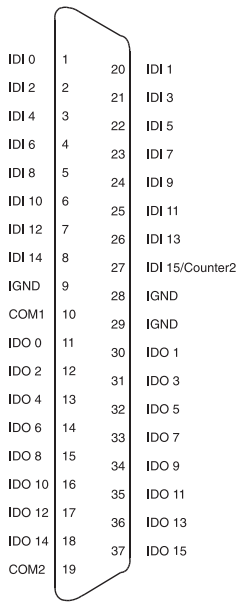
General

- **Bus Type** PCI V2.2
- **I/O Connectors** 1 x 37-pin D-type female connector
  1 x 2-pin terminal block for extended ground
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 850 mA
  Max: 5 V @ 1.0 A
- **Operating Temperature** 0 ~ 70° C (32 ~ 158° F)
- **Storing Temperature** -20 ~ 80° C (-4 ~ 176° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCI-1750** 32-ch isolated digital I/O and counter card
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m
- **ADAM-3937** 37-pin D-type cable wiring terminal for DIN-rail mounting

Pin Assignments



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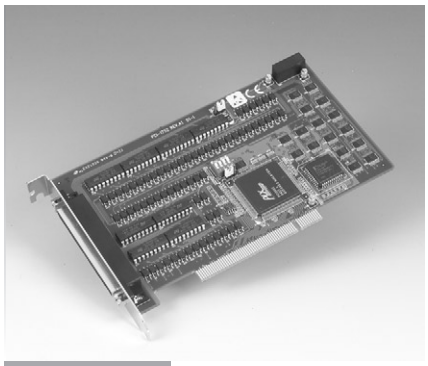
PCI-1752U/1752USO
PCI-1754
PCI-1756

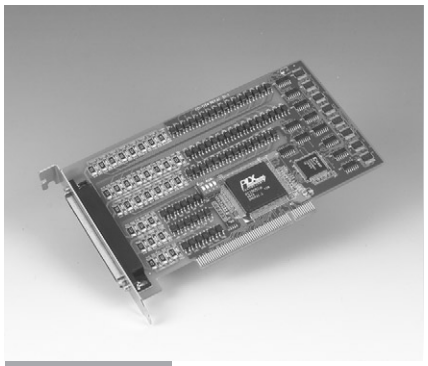
64-ch Isolated Digital Output Card

64-ch Isolated Digital Input Card

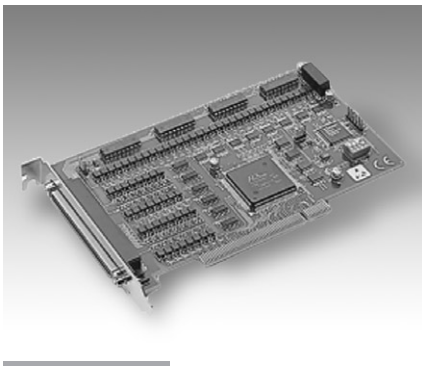
64-ch Isolated Digital I/O Card



PCI-1752



PCI-1754



PCI-1756

Features

- 64 isolated digital output channels
- High-voltage isolation on output channels (2500 V_{DC})
- 2000 V_{DC} ESD protection
- Wide output range (5 ~ 40 V_{DC})
- High-sink current on isolated output channels (200 mA max./channel)
- Output status read-back
- Keeps digital output values when hot system reset
- Channel-freeze function
- High-density 100-pin SCSI connector
- Support sink (1752U) & Source (1752USO) DO type

Specifications

Isolated Digital Output

Channels	64 (16-ch/group)
Output Type	Sink (NPN)
Isolation Protection	2,500 V_{DC}
Output Voltage	5 ~ 40 V_{DC}
Sink Current	200 mA max./channel
Opto-isolator Response	25 µs

General

Bus Type	Universal PCI V2.2
I/O Connectors	1 x 100-pin SCSI-II female
Dimensions (L x H)	175x100mm (6.9" x 3.9")
Power Consumption	Typical: +5 V @ 230 mA Max.: +5 V @ 500 mA
Operating Temperature	0 ~ 60° C (32 ~ 140° F) (IEC 68-2-1, 2)
Storing Temperature	-20 ~ 70° C (-4 ~ 158° F)
Storing Humidity	5 ~ 95% RH, (IEC 68-2-3) non-condensing

Ordering Information

PCI-1752U	PCI-1752U 64-ch isolated PCI card (Sink type)
PCI-1752USO	64-ch isolated PCI card (Source type)
PCI-10250-1	1w-pin to two 50-pin SCSI Casle, Im
ADAM-3951	Wiring terminal module with LED-indicators for DIN-rail Mounting

Features

- 64 isolated digital input channels
- Either +/- voltage input for DI by group
- High-voltage isolation on input channels (2500 V_{DC})
- High over-voltage protection (70 V_{DC})
- Wide input range (10 ~ 50 V_{DC})
- Interrupt handling capability
- High-density 100-pin SCSI connector

Specifications

Isolated Digital Input

Channels	64 (16-ch/group)
Input Voltage	Logic 0: 3 V max. Logic 1: 10 V min. (50 V max.)
Input Current (Typical)	10 V_{DC} @ 1.7 mA, 12 V_{DC} @ 2.1 mA 24 V_{DC} @ 4.4 mA, 48 V_{DC} @ 9.0 mA 50 V_{DC} @ 9.4 mA
Interrupt Capable Ch.	4
Isolation Protection	2,500 V_{DC}
Overvoltage Protection	70 V_{DC}
ESD	2,000 V_{DC}
Opto-Isolator Response	25 µs

General

Bus Type	PCI V2.2
I/O Connectors	100-pin SCSI-II female
Dimensions (L x H)	175 x 100mm (6.9" x 3.9")
Power Consumption	Typical: +5 V @ 340 mA Max.: +5 V @ 450 mA
Operating Temperature	0 ~ 60° C (32 ~ 140° F) (IEC 68-2-1, 2)
Storing Temperature	-20 ~ 70° C (-4 ~ 158° F)
Storing Humidity	5 ~ 95% RH (IEC 68-2-3) non-condensing

Ordering Information

PCI-1754	64-ch isolated digital input card
PCI-10250-1	1w-pin to two 50-pin SCSI Casle, Im
ADAM-3951	Wiring terminal module with LED-indicators for DIN-rail Mounting

Features

- Either +/- voltage input for DI by group
- Output status read-back for output channels
- Keeps digital output values after hot system reset

Specifications

Isolated Digital Input

Channels	32 (16-ch/group)
Input Voltage	Logic 0: 3 V max. Logic 1: 10 V min. (50 V max.)
Interrupt Capable Ch.	2 (IDI0, IDI16)
Isolation Protection	2,500 V_{DC}
Overvoltage Protection	70 V_{DC}
ESD	2,000 V_{DC}
Opto-Isolator Response	25 µs
Input Current	10 V_{DC} @ 1.7 mA, 12 V_{DC} @ 2.1 mA 24 V_{DC} @ 4.4 mA, 48 V_{DC} @ 9.0 mA 50 V_{DC} @ 9.4 mA

Isolated Digital Output

Channels	32 (16-ch/group)
Output Type	Sink (NPN)
Isolation Protection	2,500 V_{DC}
Output Voltage	5 ~ 40 V_{DC}
Sink Current	200 mA max./channel
Opto-isolator Response	25 µs

General

Bus Type	PCI V2.2
I/O Connectors	1 x 100-pin SCSI-II female
Dimensions (L x H)	175x100mm (6.9" x 3.9")
Power Consumption	Typical: +5 V @ 285 mA Max.: +5 V @ 475 mA
Operating Temperature	0 ~ 60° C (32 ~ 140° F) (IEC 68-2-1, 2)
Storing Temperature	-20 ~ 70° C (-4 ~ 158° F)
Storing Humidity	5 ~ 95 % (IEC 68-2-3) non-condensing

Ordering Information

PCI-1756	64-ch Isolated Digital I/O Card
PCI-10250-1	1w-pin to two 50-pin SCSI Casle, Im
ADAM-3951	Wiring terminal module with LED-indicators for DIN-rail Mounting

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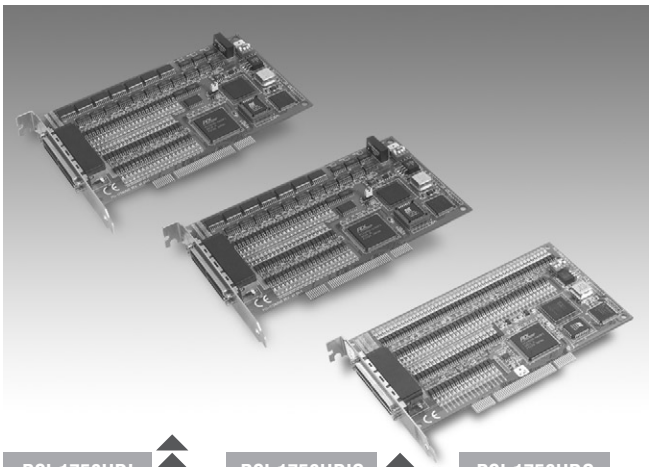
PCI-1758UDI
PCI-1758UDO
PCI-1758UDIO

128-ch Isolated Digital Input Card

128-ch Isolated Digital Output Card

128-ch Isolated Digital I/O Card



PCI-1758UDI PCI-1758UDIO PCI-1758UDO

Features

PCI-1758UDO and PCI-1758UDIO

- 128 isolated digital output channels (64 for PCI-1758UDIO)
- High-voltage isolation on output channels (2,500 V_{DC})
- Wide output range (5 ~ 40 V_{DC})
- High-sink current for isolated output channels (90 mA max./Channel)
- Current protection for each port
- BoardID™ switch
- Output status read-back
- Digital output value retained after hot system reset
- Programmable Power-Up States
- Watchdog timer

PCI-1758UDI and PCI-1758UDIO

- 128 isolated digital input channels (64 for PCI-1758UDIO)
- Wide input range (5 ~ 25 V_{DC})
- High ESD protection (2,000 V_{DC})
- Digital Filter function
- BoardID™ switch
- Interrupt handling capability for each channel

Specifications

Isolated Digital Input

- **Channels** PCI-1758UDI: 128
PCI-1758UDIO: 64
- **Input Voltage** Logic 0: 2.5 V max.
Logic 1: 5 V min. (25 V max.)
- **Interrupt Capable Ch.** PCI-1758UDI: 128
PCI-1758UDIO: 64
- **Isolation Protection** 2,500 V_{DC}
- **Opto-Isolator Response** 20 µs
- **Input Resistance** 3 kΩ

Isolated Digital Output

- **Channels** PCI-1758UDO: 128
PCI-1758UDIO: 64
- **Output Type** Sink (NPN)
- **Isolation Protection** 2,500 V_{DC}
- **Output Voltage** 5 ~ 40 V_{DC}
- **Sink Current** 90 mA max./channel
- **Opto-isolator Response** 20 µs

General

- **Bus Type** Universal PCI V2.2
- **I/O Connectors** 1 x MINI-SCSI HDRA-E100 Female
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption**

	PCI-1758UDI	PCI-1758UDO	PCI-1758UDIO
Typical	+5 V @ 0.3 A	+5 V @ 1.1 A	+5 V @ 1.2 A
Max.	+5 V @ 0.6 A	+5 V @ 2.2 A	+5 V @ 1.8 A

- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95 % (IEC 68-2-3) non-condensing

Ordering Information

- **PCI-1758UDI** 128-ch Isolated Digital Input Card
- **PCI-1758UDO** 128-ch Isolated Digital Output Card
- **PCI-1758UDIO** 128-ch Isolated Digital Input/Output Card
- **PCL-101100S-1** 100-pin SCSI Cable, 1 m
- **ADAM-39100** 100-pin SCSI wiring terminal, DIN-rail mounting

Feature Details

Interrupt Function (PCI-1758UDI/PCI-1758UDIO)

PCI-1758UDI and PCI-UDIO provide an interrupt function for every digital input channel. You can disable/enable the interrupt functions, and select trigger type by setting the Rising Edge Interrupt Registers or Falling Edge Interrupt Registers of the card. When the interrupt request signals occur, software will service these interrupt requests by ISR. The multiple interrupt sources provide the card with more flexibility.

Digital Filter Function (PCI-1758UDI/PCI-1758UDIO)

The digital filter function is used to eliminate glitches on input data and reduce the number of changes to examine and process. The filter blocks pulses that are shorter than the specified timing interval and passes pulses that are twice as long as the specified interval. Intermediate-length pulses that are longer than half of the interval, but less than the interval, may or may not pass the filter depending on your settings.

Pin Assignments

CNB

PEF_COMM	100	50	PAB_COMM	NC	1	51	NC
PEF_COMM	99	49	PAB_COMM	NC	2	52	NC
PF_IDI07	98	48	PB_IDI07	NC	3	53	NC
PF_IDI06	97	47	PB_IDI06	NC	4	54	NC
PF_IDI05	96	46	PB_IDI05	NC	5	55	NC
PF_IDI04	95	45	PB_IDI04	NC	6	56	NC
PF_IDI03	94	44	PB_IDI03	P0_IDI00	7	57	P4_IDI00
PF_IDI02	93	43	PB_IDI02	P0_IDI01	8	58	P4_IDI01
PF_IDI01	92	42	PB_IDI01	P0_IDI02	9	59	P4_IDI02
PF_IDI00	91	41	PB_IDI00	P0_IDI03	10	60	P4_IDI03
PE_IDI07	90	40	PA_IDI07	P0_IDI04	11	61	P4_IDI04
PE_IDI06	89	39	PA_IDI06	P0_IDI05	12	62	P4_IDI05
PE_IDI05	88	38	PA_IDI05	P0_IDI06	13	63	P4_IDI06
PE_IDI04	87	37	PA_IDI04	P0_IDI07	14	64	P4_IDI07
PE_IDI03	86	36	PA_IDI03	P1_IDI00	15	65	P5_IDI00
PE_IDI02	85	35	PA_IDI02	P1_IDI01	16	66	P5_IDI01
PE_IDI01	84	34	PA_IDI01	P1_IDI02	17	67	P5_IDI02
PE_IDI00	83	33	PA_IDI00	P1_IDI03	18	68	P5_IDI03
NC	82	32	NC	P1_IDI04	19	69	P5_IDI04
NC	81	31	NC	P1_IDI05	20	70	P5_IDI05
NC	80	30	NC	P1_IDI06	21	71	P5_IDI06
NC	79	29	NC	P1_IDI07	22	72	P5_IDI07
NC	78	28	NC	P01_COMM	23	73	P45_COMM
NC	77	27	NC	P01_COMM	24	74	P45_COMM
NC	76	26	NC	NC	25	75	NC
NC	75	25	NC	NC	26	76	NC
PCD_COMM	74	24	P89_COMM	NC	27	77	NC
PCD_COMM	73	23	P89_COMM	NC	28	78	NC
PD_IDI07	72	22	P9_IDI07	NC	29	79	NC
PD_IDI06	71	21	P9_IDI06	NC	30	80	NC
PD_IDI05	70	20	P9_IDI05	NC	31	81	NC
PD_IDI04	69	19	P9_IDI04	NC	32	82	NC
PD_IDI03	68	18	P9_IDI03	P2_IDI00	33	83	P6_IDI00
PD_IDI02	67	17	P9_IDI02	P2_IDI01	34	84	P6_IDI01
PD_IDI01	66	16	P9_IDI01	P2_IDI02	35	85	P6_IDI02
PD_IDI00	65	15	P9_IDI00	P2_IDI03	36	86	P6_IDI03
PC_IDI07	64	14	P8_IDI07	P2_IDI04	37	87	P6_IDI04
PC_IDI06	63	13	P8_IDI06	P2_IDI05	38	88	P6_IDI05
PC_IDI05	62	12	P8_IDI05	P2_IDI06	39	89	P6_IDI06
PC_IDI04	61	11	P8_IDI04	P2_IDI07	40	90	P6_IDI07
PC_IDI03	60	10	P8_IDI03	P3_IDI00	41	91	P7_IDI00
PC_IDI02	59	9	P8_IDI02	P3_IDI01	42	92	P7_IDI01
PC_IDI01	58	8	P8_IDI01	P3_IDI02	43	93	P7_IDI02
PC_IDI00	57	7	P8_IDI00	P3_IDI03	44	94	P7_IDI03
NC	56	6	NC	P3_IDI04	45	95	P7_IDI04
NC	55	5	NC	P3_IDI05	46	96	P7_IDI05
NC	54	4	NC	P3_IDI06	47	97	P7_IDI06
NC	53	3	NC	P3_IDI07	48	98	P7_IDI07
NC	52	2	NC	P23_COMM	49	99	P67_COMM
NC	51	1	NC	P23_COMM	50	100	P67_COMM

CNA

I/O Connector Pin Assignment for PCI-1758UDI

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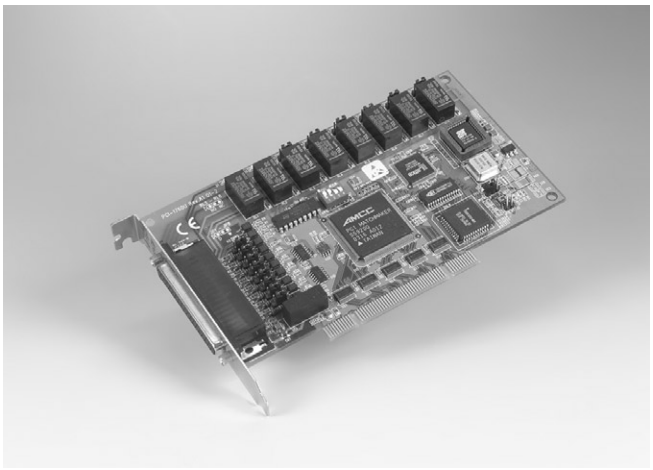
PCI-1760U

8-ch Relay Actuator and Isolated DI Card



Features

- Universal PCI card, for 3.3 V and 5 V PCI slot
- 8 opto-isolated digital input channels
- 8 relay actuator output channels
- 2 opto-isolated PWM outputs
- LED indicators to show activated relays
- Jumper selectable dry contact/wet contact input signals
- Up event counters for DI
- Programmable digital filter function for DI
- Pattern match interrupt function for DI
- "Change of State" interrupt function for DI
- Universal PCI and BoardID switch

RoHS FCC CE

Introduction

PCI-1760U relay actuator and isolated digital input card is a PC add-on card for the PCI bus. It meets the PCI standard Rev. 2.2 (Universal PCI expansion card), and works with both 3.3 V and 5 V PCI slots. It provides 8 opto-isolated digital inputs with isolation protection of 2,500 V_{DC} for collecting digital inputs in noisy environments, 8 relay actuators that can be used as a on/off control devices or small power switches, and 2 isolated PWM (Pulse Width Modulation) outputs for custom applications.

For easy monitoring, each relay is equipped with one red LED to show its on/off status. Each isolated input supports both dry contact and wet contact so that it can easily interface with other devices when no voltage is present in the external circuit.

Specifications

Isolated Digital Input

- **Channels** 8 (Sink)
- **Input Voltage** Logic 0: 1.0 V max.
Logic 1: 4.5 V min. (12 V max.)
- **Interrupt Capable Ch.** 8 (IDI0 ~ IDI7)
- **Isolation Protection** 2,500 V_{DC}
- **Opto-Isolator Response** 25 µs
- **Input Resistance** 1 kΩ 1/4 W

Counter/Timer

- **Channels** 8
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 500 Hz
- **Isolation Protection** 2,500 V_{DC}
- **PWM Channels** 2
- **Digital Noise Filter** Minimum effective high input period ≥ [(2 ~ 65535) x 5 ms] + 5 ms
Minimum effective low input period ≥ [(2 ~ 65535) x 5 ms] + 5 ms

Relay Output

- **Channels** 8
- **Relay Type** 2 x Form C, and 6 x Form A
- **Contact Rating** 120 V_{DC} @ 0.5 A, or 30 V_{DC} @ 1 A
- **Relay on Time** 5 ms max.
- **Relay off Time** 5 ms max.
- **Life Span** 200,000 operations @ 0.5 A 120 V_{AC}
500,000 operations @ 1.0 A 30 V_{DC}
- **Resistance** Contact: < 100 mΩ
Insulation: 50 MΩ

General

- **Bus Type** PCI-1760U: Universal PCI V2.2
- **I/O Connectors** 1 x 37-pin D-type connector, female
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 450 mA
Max: +5 V @ 850 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (IEC 68 - 2 - 1, 2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95 % RH, non-condensing (IEC 68-2-3)

Ordering Information

- **PCI-1760U** 8-ch Relay Actuator and Isolated D/I Card
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m
- **ADAM-3937** DB37 wiring terminal for DIN-rail mounting

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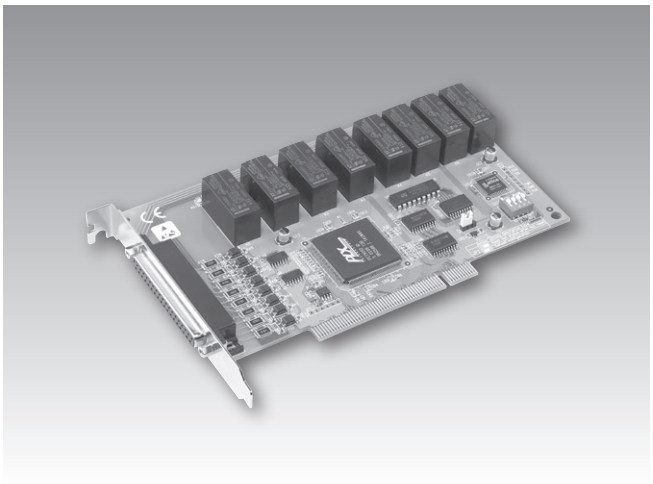
PCI-1761

8-ch Relay Actuator/Isolated DI PCI Card



Features

- 8 relay output channels and 8 isolated digital input channels
- LED indicators to show activated relays
- 4 Form C and 4 Form A type relay output channels
- Male DB37 matching connector included
- Output status read-back
- Retained relay output values when hot system reset
- High-voltage isolation on input channels (3,750 V_{DC})
- High ESD protection (2,000 V_{DC})
- High over-voltage protection (70 V_{DC})
- Wide input range (10 ~ 50 V_{DC})
- Interrupt handling capability
- BoardID™ switch

Introduction

The PCI-1761 relay actuator and isolated D/I card is an add-on card for the PCI bus. It provides 8 optically-isolated digital inputs with isolation protection of 3,750 V_{DC} for collecting digital inputs in noisy environments and 8 relay actuators for serving as on/off control devices or small power switches. For easy monitoring, each relay is equipped with one red LED to show its on/off status. The PCI-1761's eight optically-isolated digital input channels are ideal for digital input in noisy environments or with floating potentials.

The PCI-1761 digital input channels feature a rugged isolation protection for industrial, lab and machinery automation applications. It durably withstands voltage up to 3,750 V_{DC}, protecting your host system from any incidental harms. If connected to an external input source with surge-protection, the PCI-1761 can offer up to a maximum of 2,000 V_{DC} ESD (Electrostatic Discharge) protection. Even with an input voltage rising up to 70 V_{DC}, the PCI-1761 can still manage to work properly, albeit for only a short period of time.

When the system has undergone a hot reset (i.e. without turning off the system power), the PCI-1761 can either retain output values of each channel, or return to its default configuration as open status, depending on its onboard jumper setting. This function protects the system from unwanted operations during unexpected system resets.

Specifications

Isolated Digital Input

- **Channels** 8
- **Input Voltage** Logic 0: 3 V max.
  Logic 1: 5V min. (50V max.).
- **Interrupt Capable Ch.** 8
- **Isolation Protection** 3,750 V_{DC}
- **Overvoltage Protection** 70 V_{DC}
- **Opto-Isolator Response** 25 µs
- **Input Resistance** 5600 Ω
- **Input Current** 1.6 mA @ 10 V_{DC}, 8.9 mA @ 50 V_{DC}

Relay Output

- **Channels** 8
- **Relay Type** SPDT (4 x Form C, and 4 x Form A)
- **Contact Rating** 250 V_{AC} @ 3 A, or 24 V_{DC} @ 3 A
- **Relay on Time** 15 ms max.
- **Relay off Time** 5 ms max.
- **Life Span** 2 x 107
- **Resistance**
  Contact: 50 MΩ
  Insulation: 1 GΩ min.

General

- **Bus Type** PCI V2.2
- **I/O Connectors** 1 x 37-pin D-type
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 220 mA
  Max: +5 V @ 750 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95 % RH, non-condensing (IEC 68-2-3)

Ordering Information

- **PCI-1761** 8-ch Relay Actuator/Isolated DI PCI Card
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m
- **ADAM-3937** DB37 Wiring Terminal for Din-rail Mounting
- **PCLD-880** Universal screw terminal board

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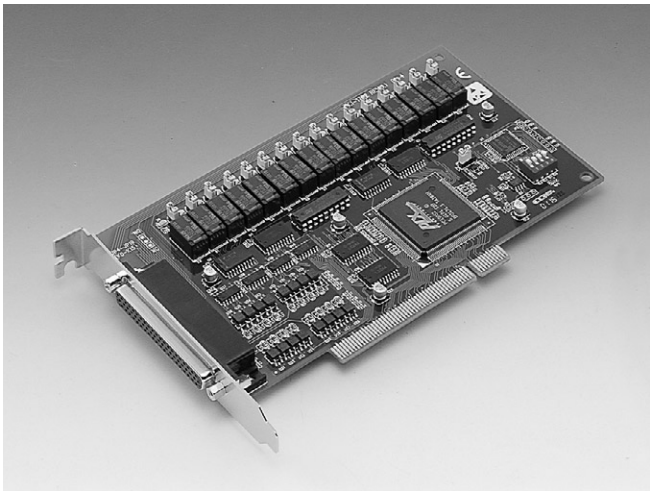
PCI-1762

16-ch Isolated DI/Relay Output Card



Features

- 16 relay output channels and 16 isolated digital input channels
- LED indicators to show activated relays
- Jumper selectable Form A/Form B-type relay output channel
- Output status read-back
- Retain relay output values when hot system reset
- High-voltage isolation on input channels (2,500 V_{DC})
- High ESD protection (2,000 V_{DC})
- High over-voltage protection (70 V_{DC})
- Wide input range (10 ~ 50 V_{DC})
- Interrupt handling capability
- High-density DB-62 connector
- BoardID™ switch

Introduction

The PCI-1762 relay actuator and isolated D/I card is a PC add-on card for the PCI bus. It provides 16 opto-isolated digital inputs with isolation protection of 2,500 V_{DC} for collecting digital inputs in noisy environments, 16 relay actuators for serving as on/off control devices or small power switches. For easy monitoring, each relay is equipped with one red LED to show its on/off status. The PCI-1762's sixteen optically-isolated digital input channels are ideal for digital input in noisy environments or with floating potentials.

Specifications

Isolated Digital Input

- **Channels** 16
- **Input Voltage** Logic 0: 3 V max.
Logic 1: 10 V min. (50 V max.)
- **Interrupt Capable Ch.** 2
- **Isolation Protection** 2,500 V_{DC}
- **Overvoltage Protection** 70 V_{DC}
- **Opto-Isolator Response** 25 µs
- **Input Resistance** 4.7 KΩ

Relay Output

- **Channels** 16
- **Relay Type** SPDT (Form A or Form B, jumper selectable)
- **Contact Rating** 0.5 A @ 125 V_{AC} or 1 A @ 30 V_{DC}
- **Relay on Time** 6 ms max.
- **Relay off Time** 4 ms max.
- **Life Span** 2 x 105 ops. min. (0.5 A @ 125 V_{AC}),
5 x 105 ops. min. (1 A @ 30 V_{DC})
- **Resistance** Contact: 50 MW
Insulation: 1,000 MW min. (at 500 V_{DC})

General

- **Bus Type** PCI V2.2
- **I/O Connectors** 1 x DB62 D-type female
- **Dimensions (L x H)** 175 x 100 mm (69" x 3.9")
- **Power Consumption** Typical: +5V @ 250 mA
Max: +5V @ 620 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (IEC 68-2-1,2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 - 95 % non-condensing (IEC 68-2-3)

Ordering Information

- **PCI-1762** 16-ch Isolated DI/Relay Output Card
- **PCL-10162-1** PCL-10162-1 DB-62 cable assembly, 1 m
- **PCL-10162-3** PCL-10162-3 DB-62 cable assembly, 3 m
- **PCL-10162-5** PCL-10162-5 DB-62 cable assembly, 5 m
- **ADAM-3962** DB62 Wiring Terminal for Din-rail Mounting

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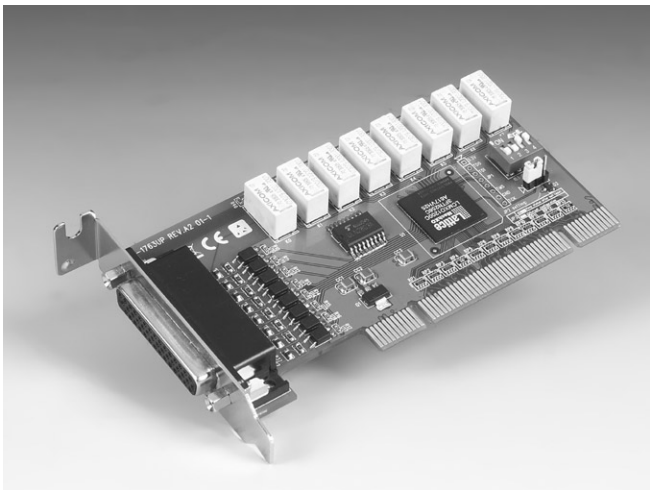
PCI-1763UP

Low-profile 8-ch Relay/Isolated DI Card



Features

- 8 relay output channels and 8 isolated digital input channels
- LED indicators to show activated relays
- 8 Form C type relay output channels
- Output status read-back
- Retained relay output values when hot system reset
- High-voltage isolation on input channels (2,500 V_{DC})
- High ESD protection (2,000 V_{DC})
- High over-voltage protection (70 V_{DC})
- Wide input range (10 ~ 50 V_{DC})
- Interrupt handling capability
- Support Universal PCI Bus
- Low Profile PCI card
- BoardID™ switch

Introduction

PCI-1763UP relay actuator and isolated digital input card is an add-on card for the PCI bus. It provides 8 optically-isolated digital inputs with isolation protection of 2500 V_{DC} for collecting digital inputs in noisy environments, and 8 relay actuators for serving as on/off control devices or small power switches. For easy monitoring, each relay is equipped with one red LED to show its on/off status. PCI-1763UP's eight optically-isolated digital input channels are ideal for digital input in noisy environments or with floating potentials. The low profile PCI form factor and universal PCI connector (V2.2 compliant), meet requirements for size and reduced power consumption.

Specifications

Isolated Digital Input

- **Channels** 8
- **Input Voltage** Logic 0: 3 V max.
Logic 1: 10 V min. (50 V max.)
- **Input Current** 3.16 mA @ 10 V_{DC}
17.3 mA @ 50 V_{DC}
- **Interrupt Capable Ch.** 8
- **Isolation Protection** 2,500 V_{DC}
- **Overvoltage Protection** 70 V_{DC}
- **Opto-isolator Response** 25 µs
- **Input Resistance** 2.8 KΩ

Relay Output

- **Channels** 8
- **Relay Type** DPDT, Form C
- **Contact Rating** 240 V_{AC} @ 0.25 A, or 30 V_{DC} @ 1 A
- **Relay on Time** 5 ms max.
- **Relay off Time** 4 ms max.
- **Life Span** 1 x 10^7 @ 6 V/100 mA
- **Resistance** Contact: < 50 mΩ
Insulation: 1 GΩ min. (at 500 V_{DC})

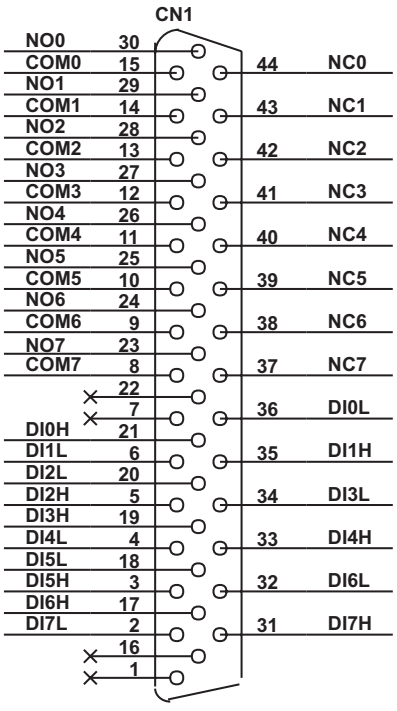
General

- **I/O Connector Type** DB44 female
- **Dimensions** 119.91 x 64.41 mm (Low-Profile MD1)
- **Power Consumption** +5V @ 107.5 mA (typical)
+5V @ 301.3 mA (max.)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1,2)
- **Storing Temperature** -20 ~ 70° C (-4 ~158° F)
- **Storing Humidity** 5 ~ 95 % RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCI-1763UP** Low-profile 8-ch Relay/Isolated DI Card
- **PCL-10144-1** DB 44-pin cable, 1 m
- **ADAM-3944** DB-44 Wiring Terminal for DIN-rail mounting

Pin Assignments



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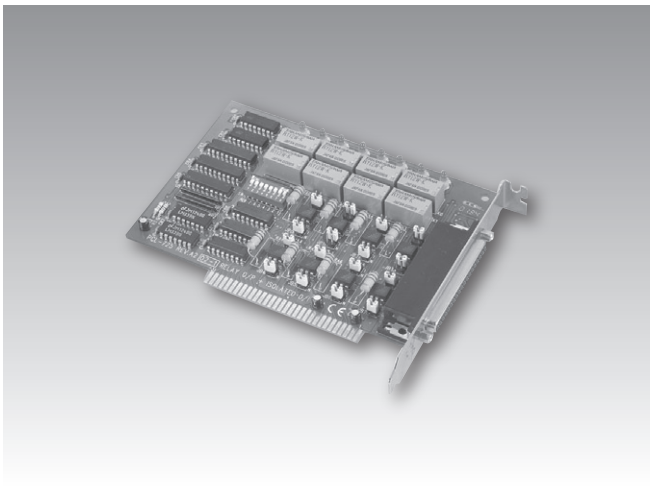
PCL-725

8-ch Relay Actuator/Isolated DI ISA Card



Features

- 8 relay output channels and 8 isolated digital input channels
- LED indicators to show activated relays
- 4 Form C and 4 Form A type relay output channels
- Male DB37 matching connector included
- Output status read-back

Introduction

The PCI-1761 relay actuator and isolated D/I card is an add-on card for the PCI bus. It provides 8 optically-isolated digital inputs with isolation protection of 3,750 V_{DC} for collecting digital inputs in noisy environments and 8 relay actuators for serving as on/off control devices or small power switches. For easy monitoring, each relay is equipped with one red LED to show its on/off status. The PCI-1761's eight optically-isolated digital input channels are ideal for digital input in noisy environments or with floating potentials.

The PCI-1761 digital input channels feature a rugged isolation protection for industrial, lab and machinery automation applications. It durably withstands voltage up to 3,750 V_{DC}, protecting your host system from any incidental harms. If connected to an external input source with surge-protection, the PCI-1761 can offer up to a maximum of 2,000 V_{DC} ESD (Electrostatic Discharge) protection. Even with an input voltage rising up to 70 V_{DC}, the PCI-1761 can still manage to work properly, albeit for only a short period of time.

When the system has undergone a hot reset (i.e. without turning off the system power), the PCI-1761 can either retain output values of each channel, or return to its default configuration as open status, depending on its onboard jumper setting. This function protects the system from unwanted operations during unexpected system resets.

Specifications

Isolated Digital Input

- **Channels** 8
- **Input Voltage** Logic 0: 3 V max.
  Logic 1: 5V min. (30V max.).
- **Interrupt Capable Ch.** 8
- **Isolation Protection** 1500 V_{DC}
- **Overvoltage Protection** 70 V_{DC}
- **Opto-Isolator Response** 25 µs
- **Input Resistance** 560 Ω
- **Input Current** 42 mA @ 24 V

Relay Output

- **Channels** 8
- **Relay Type** SPDT (4 x Form C, and 4 x Form A)
- **Contact Rating** 120 V_{AC} @ 0.5 A, or 30 V_{DC} @ 1 A
- **Relay on Time** 8 ms max
- **Relay off Time** 8 ms max
- **Life Span** 1 x 10^7
- **Resistance**
  Contact: 50 MΩ
  Insulation: 100 MΩ min.

General

- **Bus Type** ISA
- **I/O Connectors** 1 x 37-pin D-type
- **Dimensions (L x H)** 147 x 100 mm (5.75" x 3.9")
- **Power Consumption** +5 V @ < 0.2 A; +12 V @ 33 mA for each relay
  < 0.27 A if all eight relays are energized
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95 % RH, non-condensing (IEC 68-2-3)

Ordering Information

- **PCL-725** 8-ch Relay Actuator/Isolated DI ISA Card
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m
- **ADAM-3937** DB37 Wiring Terminal for Din-rail Mounting
- **PCLD-880** Universal screw terminal board

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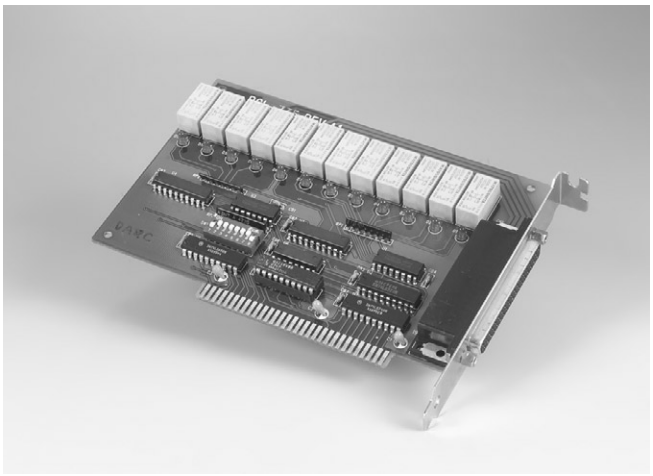
PCL-735

12-ch Relay Actuator Card



Features

- 12 relay outputs
- LED relay status indicators
- Male DB37 matching connector included
- Relay status readback function

Introduction

Ideal for applications such as On/Off control or signal switching , the PCL-735 12-channel relay actuator provides 12 SPDT relays on a half-size card.

The On/Off status of each relay is easy to monitor. A red LED next to each relay shows its On/Off status, and the software can read each relay's status. An onboard DB-37 connector provides access to all output channels.

Specifications

Relay Output

- **Channels** 12
- **Relay Type** SPDT, Form C
- **Contact Rating** 2 A @ 30 V_{DC}, 1 A @ 125 V_{AC}
- **Relay on Time** 5 ms. typical
- **Relay off Time** 5 ms. typical
- **Life Span** > 5 x 10^5 operations @ 30 V_{DC} and 2 A
  > 2 x 10^6 operations @ 30 V_{DC} and 1 A
- **Resistance** Contact: 50 MΩ
  Insulation: 1 GΩ @ 500 V_{DC} min.

General

- **Bus Type** ISA
- **I/O Connectors** 1 x 37-pin D-type female
- **Dimensions (L x H)** 155 x 100 mm (6.1" x 3.9")
- **Power Consumption** Typical: +5 V @ 280 mA
  Max: +12 V @ 200 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCL-735** 12-ch Relay Actuator Card
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m
- **PCLD-880** Screw terminal board
- **ADAM-3937** DB37 wiring terminal for DIN-rail mounting

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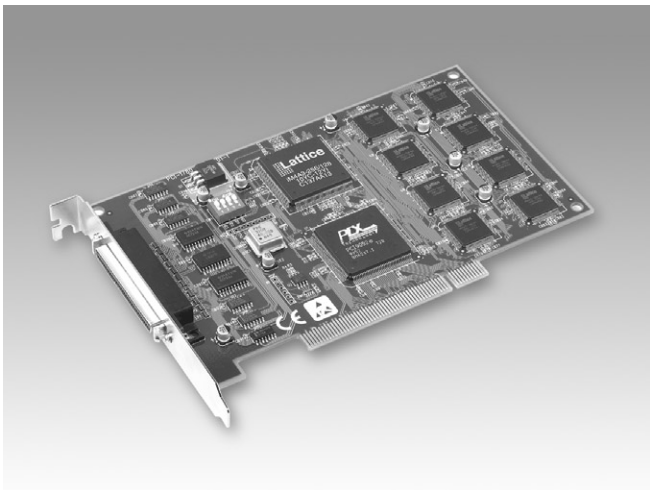
PCI-1780U

8-ch Counter/Timer Card



Features

- 8 independent 16-bit counters
- 8 programmable clock source
- 8 digital TTL outputs and 8 digital TTL inputs
- Up to 20 MHz input frequency
- Multiple counter clock source selectable
- Counter output programmable
- Counter gate function
- Flexible interrupt source select
- BoardID™ switch

Introduction

PCI-1780 is a general purpose multi-channel counter/timer card for the PCI bus. It targets the AM9513 to implement the counter/timer function by CPLD. It provides eight 16-bit counter channels, 8 digital outputs and 8 digital inputs. Its powerful counter functions cater to a broad range of industrial and laboratory applications.

The card features 12 programmable counter modes, to provide one shot output, PWM output, periodic interrupt output, time-delay output, and to measure the frequency and the pulse width. The PCL-10168 shielded cable works well with PCI-1780 to reduce noise. Its wires are all twisted pairs, and the input signals and output signals are separately shielded, providing minimal cross talk between signals and the best protection against EMI/EMC problems.

For easier configuration, PCI-1780 supports Plug & Play, and have also been equipped with an Advantech BoardID™ DIP switch that helps define each card's unique identity when multiple identical PCI cards have been installed in the same computer. The BoardID switch is very useful when you build your system with multiple identical PCI cards. With the correct BoardID switch settings, you can easily identify and access each card during hardware configuration and software programming.

Specifications

Digital Input

- **Channels** 8
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
Logic 1: 2.0 V min.
- **Interrupt Capable Ch.** CH0

Digital Output

- **Channels** 8
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.8 V
Logic 1: 2.0 V
- **Output Capability** Sink: 24 mA @ 0.8 V
Source: -15 mA @ 2.0 V

Counter/Timer

- **Channels** 8 (independent)
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 20 MHz
- **Reference Clock** Internal: 20 MHz
External clock: 20 MHz max.
- **Counter Modes** 12 (programmable)
- **Interrupt Capable Ch.** 8
- **PWM Channels** 8

General

- **Bus Type** PCI V2.2
- **I/O Connectors** 1 x 68-pin SCSI-II female
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 900 mA
Max.: +5 V @ 1.2 A
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95 % RH, non-condensing (IEC 68-2-3)

Ordering Information

- **PCI-1780** 8-ch Counter/Timer Card
- **PCL-10168-1** SCSI-68 shielded cable, 1 m
- **ADAM-3968** SCSI-68 wiring terminal, DIN-rail mount

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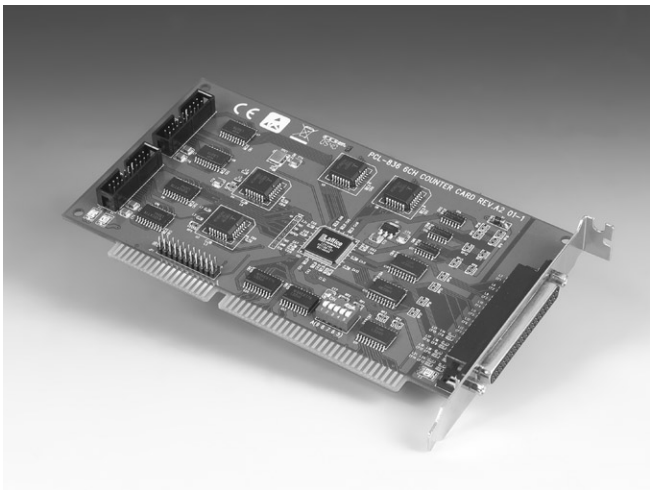
PCL-836

6-ch Counter/Timer Card



Features

- Periodic interrupt generation
- 6 independent 16-bit counters
- Digital filter for noise reduction
- Binary or BCD counting
- Programmable frequency output
- Complex duty-cycle output
- Single-shot output
- 16-bit TTL input and 16-bit TTL output ports
- Selectable interrupt input channel
- Up to 10 MHz input frequency
- Pulsewidth and period measurement
- Time-delay generation
- F/V conversion and accumulation

Introduction

PCL-836 is a general purpose counter/timer and digital I/O card for PC/AT compatible computers. It provides six 16-bit counter channels. It also includes 16 digital outputs and 16 digital inputs. Two 8254 chips provide a variety of powerful counter/timer function modes to match your industrial and/or laboratory applications.

Unique Digital Filter

PCL-836 includes a unique digital filter to eliminate noise on the input signal. The frequency can be adjusted to provide more stable output readings.

Specifications

Digital Input

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.0 V min.

Digital Output

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.8 V
  Logic 1: 2.0 V
- **Output Capability** Sink: 8 mA @ 0.8 V
  Source: -0.4 mA @ 2.0 V

Counter/Timer

- **Channels** 6
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 10 MHz
- **Reference Clock** Internal: 10 MHz
  External clock: 10 MHz
- **Counter Modes** 6 programmable counter modes
- **Interrupt Capable Ch.** IRQ 2, 4, 5, 7, 10, 11, 12, 15 (jumper selectable)
- **PWM Channels** 3
- **Digital Noise Filter** 1.6 ms to 52 ms (programmable)

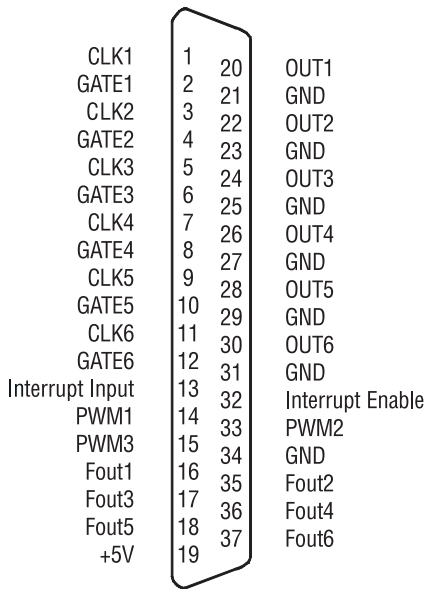
General

- **Power Consumption** +5 V @ 360 mA (typical)
  +5 V @ 400 mA (max.)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storage Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Operating Humidity** 5 ~ 95% RH non-condensing (refer to IEC 68-2-3)
- **Connector** One 37-pin D-type female connector for counter I/O
  Two 20-pin male flat-cable connector for digital I/O
- **Dimensions (L x H)** 185 x 100 mm (7.3" x 3.9")

Ordering Information

- **PCL-836** 6-ch Counter/Timer Card
- **PCL-10137-1** DB37 cable assembly, 1 m
- **PCL-10137-2** DB37 cable assembly, 2 m
- **PCL-10137-3** DB37 cable assembly, 3 m
- **PCLD-880** Screw terminal board
- **ADAM-3937** DB-37 wiring terminal for DIN-rail mounting

Pin Assignments



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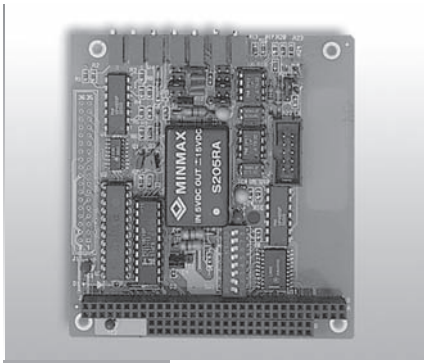
PCM-3712
PCM-3718H/HG/HO
PCM-3724

2-ch Analog Output Module
12-bit Multifunction Module with Programmable Gain
48-ch Digital I/O Module



PCM-3712

Features

- Good selection of output ranges, including current loop, unipolar and bipolar.

Specifications

Analog Output

- **Channels** 2
- **Resolution** 12 bits
- **Output Rate** Static update
- **Output Range**

Internal Reference	Unipolar (V)	0~5, 0~10
	Bipolar (V)	± 2.5, ±5, ±10
	Current Loop	4 ~ 20 mA
External Reference		±10 V

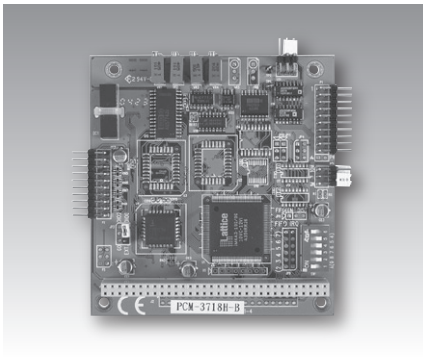
- **Slew Rate** 0.3 V/μs typ. (Voltage) 1.2 mA/μs (Current)
- **Driving Capability** ±5 mA
- **Output Impedance** 0.1 Ω max./0.02 Ω typ.
- **Accuracy**
  Relative: ±1 LSB
  Differential Non-Linearity ±1/2 LSB

General

- **Bus Type** PC/104
- **I/O Connectors** 1 x 10-pin box header
- **Dimensions (L x H)** 96 x 90 mm (3.8"x 3.5")
- **Power Consumption** 5 V @ 700 mA max.
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -20 ~ 85° C (-4~185° F)
- **Storing Humidity** 0 ~ 90% RH, noncondensing

Ordering Information

- **PCM-3712** 2-ch AO Module (18 cm flat cable 10-pin to DB9-F included)
- **ADAM-3909** DB9 cable wiring for DIN-rail mounting



PCM-3718H/HG/HO

Specifications

Analog Input

- **Channels** 16 single-ended, or 8 differential inputs
- **Resolution** 12 bits
- **Max. Sampling Rate** 100 kHZ* (DAM transfer)
  *80 kHz on P4-based (or upper) system.
- **Input Impedance** 10 MΩ
- **Sampling Modes** Software, pacer or ext.
- **Input Range**
- **80 kHz on P4-based (or upper) system.**

PCM-3718H and PCM-3718HO

- **Bipolar** ±10, ±5, ±2.5, ±1.25, ±0.625
- **Unipolar** 0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25

PCM-3718HG

- **Bipolar** ±10, ±5, ±1, ±0.5, ±0.1, ±0.05, ±0.01, ±0.005
- **Unipolar** 0 ~ 10, 0 ~ 1, 0 ~ 0.1, 0 ~ 0.01

Analog Output (PCM-3718HO only)

- **Channels** 1 (12 bits)
- **Output Rate** Static update
- **Output Range**

Internal Reference	Unipolar (V)	0 ~ 5, 0 ~ 10
External Reference (V)		0 ~10, 0 ~ -10

- **Slew Rate** 10 V/μs
- **Driving Capability** 10 mA
- **Output Impedance** 0.1 Ω max.
- **Accuracy** Relative: ±1 LSB

Digital Input/Output

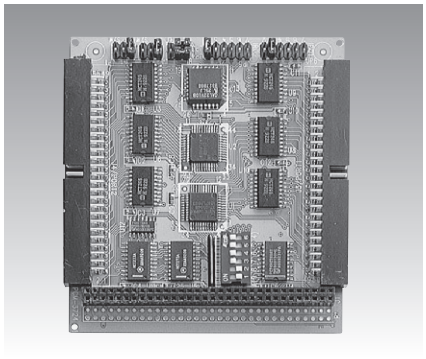
- **Channels** 16, 5V/TTL
- **Input Voltage** Logic 0: 0.8 V max. Logic 1: 2.0 V min.
- **Output Voltage**
  Logic 0: 0.33 V max. @ 6 mA (sink)
  Logic 1: 3.84 V min. @ 6 mA (source)

General

- **Bus Type** PC/104
- **I/O Connectors** 2 x 20-pin box header
- **Dimensions (L x H)** 96 x 90 mm (3.8"x 3.5")
- **Power Consumption** Typical: 5 V @ 180 mA Max.: 5 V @ 400 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -40~85°C (-40 ~ 185° F)

Ordering Information

- **PCM-3718H** 12-bit Multifunction Module w/ Programmable Gain (cable not included)
- **PCM-3718HG** PCM-3718H w/high gain
- **PCM-3718HO** PCM-3718H w/AO
- **ADAM-3920** 20-pin flat cable wiring terminal for DIN-Rail
- **PCLD-780** Screw-terminal board for 20-pin flat cable
- **PCL-10120-1** 20-pin flat cable, 1 m
- **PCL-10120-2** 20-pin flat cable, 2 m
- **ADAM-3909** DB-9 Cable Wiring Terminal



PCM-3724

Features

- Output status read back
- Channels simulate 8255 PPI mode 0
- Interrupt triggering, rising/falling edge

Specifications

Digital Input

- **Channels** 48 (shared with output)
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max. Logic 1: 2.0 V min.
- **Interrupt Capable Ch.** 1

Digital Output

- **Channels** 48 (shared with input)
- **Compatibility** 5 V/TTL
- **Output Voltage**
  Logic 0: 0.5 V max. @ 24 mA (sink)
  Logic 1: 2.0 V min. @ 15 mA (source)

General

- **Bus Type** PC/104
- **I/O Connectors** 2 x 50-pin box header
- **Dimensions (L x H)** 96 x 90 mm (3.8"x 3.5")
- **Power Consumption** 5 V @ 90 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -40 ~ 85° C (-40 ~185° F)
- **Storing Humidity** 0 ~ 90% RH, non-condensing

Ordering Information

- **PCM-3724** 48-ch DI/O Module (cable not included)
- **ADAM-3950** 50-pin flat cable wiring terminal for DIN-Rail mounting
- **PCLD-785B** 24-ch Relay Output Board
- **PCLD-782B** 24-ch Opto-isolated DI Board
- **PCL-10150-1.2** 50-pin flat cable, 1.2 m

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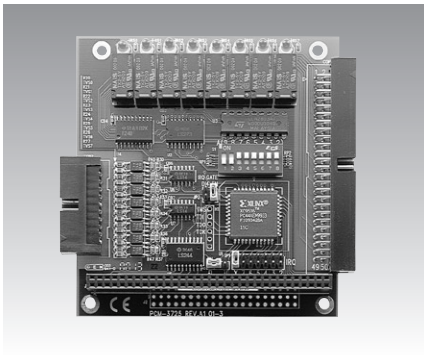
PCM-3725
PCM-3730
PCM-3780

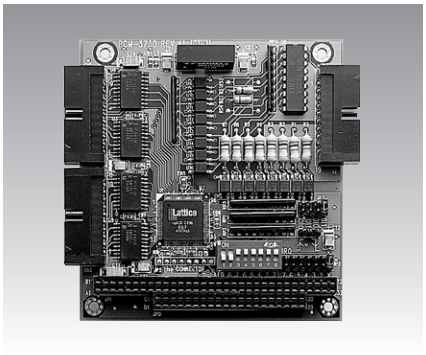
8-ch Isolated DI/Relay Output Module

16-ch Isolated Digital I/O Module

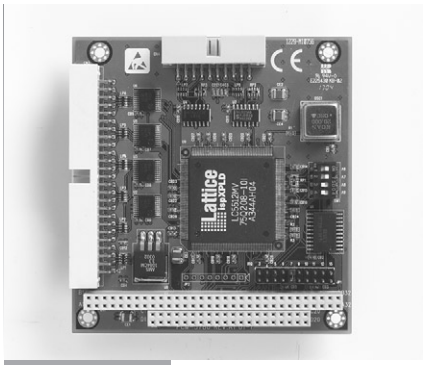
2-ch Counter/Timer with 24-ch TTL DI/O Module



PCM-3725



PCM-3730



PCM-3780

Features

- LED indicators to show activated relays

Specifications

Isolated Digital Input

- **Channels** 8
- **Input Voltage** Logic 0: 3 V
  Logic 1: 10 V (50 V max.)
- **Isolation Protection** 2500 V_{DC}
- **Overvoltage Protection** 70 V_{DC}
- **Opto-Isolator Response** 25 µs
- **Input Resistance** 4.7 KΩ

Relay Output

- **Channels** 8
- **Relay Type** SPDT (Form C)
- **Contact Rating** 30 V_{DC}@ 1.5 A
- **Relay on Time** 4 ms
- **Relay off Time** 4 ms
- **Life Span** 100000 min @ 2 A/30 V
- **Resistance** Contact: 100 MΩ
  Insulation:
  1 GΩ @ 500 V_{DC}

General

- **Bus Type** PC/104
- **I/O Connectors** 1 x 20-pin head for IDI
  1 x 50-pin head for relay
- **Dimensions (L x H)** 96 x 90 mm (3.8"x 3.5")
- **Power Consumption**
  Typical: 100 mA @ +5 V
  Max: 280 mA @ +5 V
- **Operating Temperature** 0 ~ 60° C (32 ~ 158° F)
- **Storing Temperature** -20~70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH, non-cond.

Ordering Information

- **PCM-3725** 8-ch Isolated DI/Relay Output Module (no cables inc.)
- **PCL-10120-1** 20-pin flat cable 1 m
- **PCL-10120-2** 20-pin flat cable 2 m
- **PCL-10150-1.2** 50-pin flat cable 1.2 m
- **ADAM-3920** 20-pin flat cable wiring terminal for DIN-rail
- **ADAM-3950** 50-pin flat cable wiring terminal for DIN-rail
- **PCLD-780** Screw-Terminal Board for 20-pin Flat Cable

Features

- High driving capacity and high-voltage isolation

Specifications

Digital Input

- **Channels** 16, 5 V/TTL
- **Interrupt Capable Ch.** 4

Isolated Digital Input

- **Channels** 8
- **Input Voltage**
  Logic 0: 2 V max.
  Logic 1: 5 V min. (24 V max.)
- **Isolation Protection** 2,500 V_{DC}
- **Opto-Isolator Response** 0.1 ms
- **Input Resistance** 2 kΩ @ 0.5 W

Digital Output

- **Channels** 16, 5 V/TTL
- **Output Capability**
  Sink: 8 mA @ 0.5 V max.
  Source: -0.4 mA @ 2.4 V min.

Isolated Digital Output

- **Channels** 8
- **Output Type** Sink (NPN)
- **Isolation Protection** 2,500 V_{DC}
- **Output Voltage** 5 ~ 40 V_{DC}
- **Sink Current** 200 mA max./channel
- **Opto-Isolator Response** 100 µs

General

- **Bus Type** PC/104
- **I/O Connectors** 3 x 20-pin box header
- **Dimensions (L x H)** 96 x 90 mm (3.8"x 3.5")
- **Power Consumption**
  Typical: 330 mA @ +5 V
  Max: 500 mA @ +5 V
- **Operating Temperature** 0 ~ 60° C (32 ~ 158° F)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH, non-cond.

Ordering Information

- **PCM-3730** 16-ch Isolated DI/O Module (cable included)
- **PCL-10120-1** 20-pin flat cable, 1 m
- **PCL-10120-2** 20-pin flat cable, 2 m
- **ADAM-3920** 20-pin flat cable wiring terminal for DIN-Rail mt.
- **PCLD-780** Screw-terminal board for 20-pin flat cable
- **PCLD-785/885** 16-ch relay/power relay output board

Specifications

Programmable counter

- 2 independent 16-bit counters
- 4 independent programmable clock sources (10 M, 1 M, 100 k, 10 k)
- 12 programmable counter modes

Digital Input

- **Channels** 24 (shared with output)
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
  Logic 1: 2.4 V min.
- **Interrupt Capable Ch.** 24

Digital Output

- **Channels** 24 (shared with input)
- **Compatibility** 5 V/TTL
- **Output Voltage**
  Logic 0: 0.5 V max. @ 24 mA (sink)
  Logic 1: 2.4 V min. @ 15 mA (source)

Counter/Timer

- **Channels** 2
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 20 MHz
- **Counter Modes** 12 (programmable)
- **Interrupt Capable Ch.** 2

General

- **Bus Type** PC/104
- **I/O Connectors** 1 x 50-pin box header
  1 x 20-pin box header
- **Dimensions (L x H)** 96 x 90 mm (3.8"x 3.5")
- **Power Consumption** Typical: +5 V @ 300 mA
  Max.: +5 V @ 0.8 A
- **Operating Temperature** 0 ~ 60° C (32 ~ 158° F)
- **Storing Temperature** -20~70° C (-4 ~ 158° F)
- **Operating Humidity** 5 ~ 85% RH non-cond.

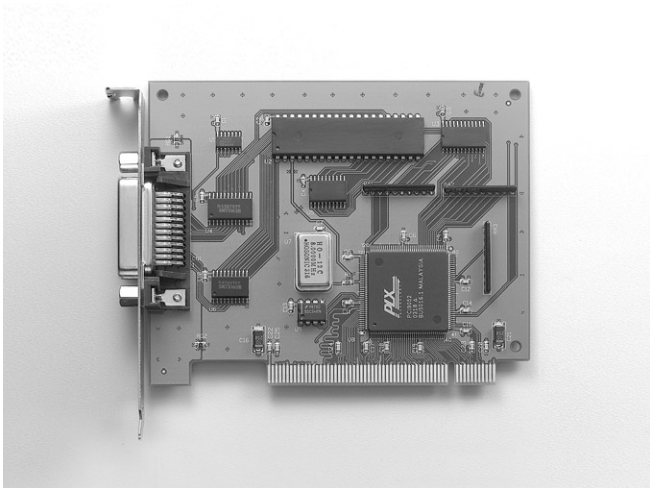
Ordering Information

- **PCM-3780** 2-ch Counter/Timer with 24-ch TTL DI/O
- **PCL-10120-1** 20-pin flat cable 1 m
- **PCL-10150-1.2** 50-pin flat cable 1.2 m
- **ADAM-3920/50** 20/50-pin flat cable wiring terminal for DIN-rail

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com

PCI-1670

GPIB Interface PCI-bus Card



FCC CE

Features

- Complete IEEE 488.2 compatibility
- Supports Windows® 95/98/NT/ME/2000/XP and DOS.
- Full driver, library, and example support, including Visual C++®, C++ Builder®, LabWindows/CVI, Visual Basic®, Delphi® and LabView® drivers.
- Provides NI-like driver & function libraries.
- PCI bus specification 2.1 compliant
- I/O address automatically assigned by PCI Plug & Play
- Provides powerful and easy-to-use configuration utility

Introduction

PCI-1670 is a high-performance PCI-bus card with a GPIB interface. The card is fully compatible with IEEE 488.1 and 488.2 standards with its PCI 2.1 bus specification. With two driver control modes: controller mode and slave mode; PCI-1670 can perform basic the IEEE 488 talker, listener and controller functions required by IEEE 488.2. You can also connect up to 15 GPIB instruments. Therefore, PCI-1670 is especially suitable for instrument measurements and control.

PCI-1670 is available for Windows 95/98/NT/ME/2000/XP and DOS, and it supports complete drivers and libraries. To make driver development easier, PCI-1670 comes with example drivers programmed in: Visual C++, C++ Builder, Labwindows/CVI, Visual Basic, Delphi and LabVIEW.

Furthermore, PCI-1670 also offers powerful testing features and a configuration utility that allows users to easily access and control instruments.

PCI-1670 offers a comprehensive supplementary controller driver database and provides NI-like commands to help users develop applications. Users can use an interactive GPIB window interface to control devices directly without any need of programming.

Specifications

GPIB

- **Compatibility** IEEE 488, 488.1, 488.2
- **GPIB Transfer Rate** 1 MB/s
- **OS Support** Windows 95/98/NT/2000/XP, DOS
- **Library Support** Visual C++, Borland C++ Builder, LabWindows/CVI, Visual Basic, Delphi, LabVIEW
- **Max. GPIB Connections** 15

General

- **Bus Type** PCI V2.1
- **I/O Connectors** 1 x IEEE 488 standard 24-pin
- **Dimensions (L x H)** 131 x 106 mm (5.15" x 4.17")
- **Operating Temperature** 0 ~ 55° C (32~131° F)
- **Storing Temperature** -20~70° C (-4 ~ 158° F)
- **Operating Humidity** 10 ~ 90% RH, non-condensing

Ordering Information

- **PCI-1670** GPIB Interface PCI-bus Card, IEEE-488 Cable, 2 M
- **PCL-1670L** GPIB Interface PCI-bus Card widthout cable
- **PCL-10488-2** IEEE-488 Cable, 2 M

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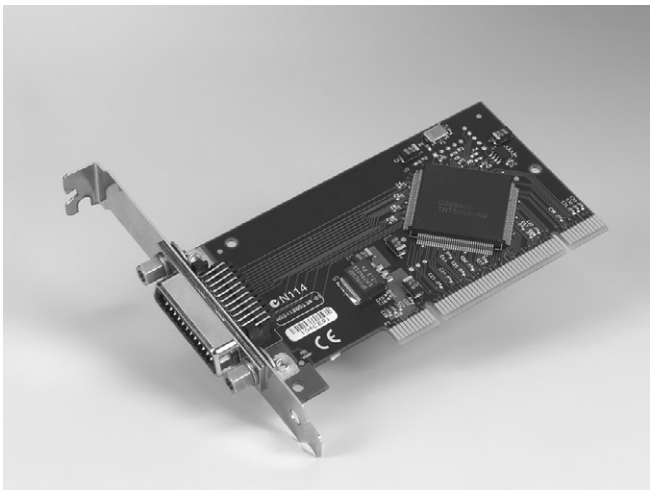
PCI-1671UP

High-Performance IEEE-488.2 Interface for PCI



Features

- IEEE 488.2 Standard interface
- Complete Talker/Listener/Controller
- Industry standard 32-bit PCI bus
- Data transfer rates over 1.5 Megabytes/sec
- 1024-word FIFO buffer
- High-Speed State Machine Bus Manager
- 7 Interrupt lines, shared interrupt capability
- Transparent interrupt enabling/disabling
- Includes GPIB-Library software
- Low profile MD1 size

CE

Introduction

The PCI-1671UP IEEE-488 interface converts any PCI bus personal computer into an instrumentation control and data acquisition system. Connect up to 14 instruments using standard IEEE-488 cables such as the PCL-10488-2, 2 meter IEEE-488 interface cable.

Greater than 1.5 MB/s Transfer Rates

The PCI-1671UP transfers data over the GPIB at rates in excess of 1.5 million bytes per second using the maximum IEEE-488 specification cable length (2 meters times the # of devices). A 1024-word FIFO buffer and the advanced REP-INSW ISR data transfer method provide the horsepower required to then transfer the data between the GPIB board and the host computer. The high-speed state machine also provides byte-to-word packing and unpacking, and because words carry twice the information that bytes do, packed data requires fewer bus cycles to transfer the same GPIB information.

IEEE-488.2 (GPIB) Compatibility

The PCI-1671UP adheres to ANSI/IEEE Standard 488-1978. Often referred to as the IEEE-488.2 bus, GPIB bus or HP-IB bus, the GPIB (General Purpose Interface Bus) is a standard for instrumentation communication and control for instruments from manufacturers the world over. The GPIB provides handshaking and interface communications over an 8-bit data bus employing 5 control and 3 handshake signals. Equipped with PCI-1671UP, a personal computer can:

Control GPIB instruments, gather data from GPIB test equipment, or become a data acquisition station in a GPIB system.

Software

The PCI-1671UP includes powerful GPIB-Library. The library greatly simplifies your programming effort. The PCI-1671UP is also supported by a wide variety of application software packages including LabWindows/CVI®, LabVIEW® and many others.

Specifications

GPIB

- **Compatibility** IEEE 488.1, 488.2
- **GPIB Transfer Rate** 1.5 MB/s
- **OS Support** Windows® 2000/XP
- **Library Support** Visual C++®, Borland C++ Builder®, LabWindows/CVI, Visual Basic®, Delphi®, LabVIEW
- **Max. GPIB Connections** 15

General

- **Bus Type** PCI-1671UP: Universal PCI V2.2
- **I/O Connectors** 1 x IEEE 488 standard 24-pin
- **Dimensions (L x H)** 119.91 x 64.41mm (Low profile MD1)
- **Power Consumption** Typical: 5 VDC @ 375 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 158° F) @ 0-90% RH
- **Storing Temperature** -40 ~ 100° C (-40 ~ 212° F) @ 5-90% RH
- **Operating Humidity** 0 ~ 90% RH, non-condensing

Ordering Information

- **PCI-1671UP** High-Performance IEEE-488.2 Interface for PCI-Bus Computers (cable is not included)
- **PCL-10488-2** IEEE-488 Cable, 2 m
- **PCL-ADP488** GPIB Adapter (Necessasy while using PCI-1671UP in low-profile chassis)
- **PCI-1671S2** High-performance IEEE-488.2 Interface Card, PCI-1671UP, with IEEE-488 cable 2 m

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